February-March 1971

EMO

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BLAST SHELTER TEST – 1970

500 tons of TNT detonated at the Defence Research Establishment Suffield, at Ralston, Alberta. Participants in tests at the explosion included the Defence Research Board, Canadian Forces, the Canada Emergency Measures Organization, agencies of the Governments of Great Britain, and the United States of America, several universities and several commercial firms. This year's projects by the Canada Emergency Measures Organization proved to be highly successful in the long term program of development of nuclear blast protection.

Canada Emergency Measures Participation In "Suffield" 500 Ton Blast Test

by
Mr. William A. Johnston, Chief, National Program Evaluation, Canada EMO
and
Mr. Jon P. Nielsen, Coordinator, Planning for Physical Protection, Canada EMO

The July 1970 500-ton explosion at the Defence Research Establishment Suffield, Alberta, marks the seventh year of DRES/Canada EMO cooperation. The October 1968 issue of the "EMO National Digest", briefly reviewed the history of the Canada EMO blast protection research program indicating the Organization's interest in two general areas; the fibreglass reinforced plastic family blast shelter, and the communal

blast shelter. Substantial advances had been made in each project since 1968 which warranted field trial tests during the summer of 1970.

In late 1969, trial director for "Event Dial Pack", code name for the 1970 test, Dr. R. B. Harvey of DRES, recommended that as many projects as possible be pre-tested in the various blast simulators at Suffield in order to reduce the probability of failure of each experiment when subjected to the actual field test. Accordingly, a pre-trial program for the Canada Emergency Measures Organization projects was set by Mr. J. S. Watson, head of Suffield's Shock and Blast Section, and Mr. W. A. Jones, DRES Project Scientist for Canada EMO projects. All Canada EMO projects were tested during the first months of 1970 in this pre-trial test program, and the success of the projects in Event Dial Pack was due substantially to this preliminary work.

Family Blast Shelters

The history of the fibreglass reinforced plastic family blast shelter was described in the EMO National Digest, October, 1968. The Mark I shelter was tested at Suffield in 1964 and proved satisfactory although costly. The Mark II shelter introduced a number of innovations in the design of the fibreglass shell which allowed substantial economies in fabrication. The Mark II family blast shelter shown in Figure 1 was tested successfully in 1966 and 1968 as a structural element.

The 1968 tests demonstrated that the shelter and its components would survive when tested independently at fifty pounds per square inch blast overpressure. Some minor problems had been encountered with the hatch cover and a new hatch cover design has been started but was not available for the 1970 test. The objective of the 1970 test was to determine if the shelter complete with blast valve, ventilation, water and sewage systems, and interim furnishing, could operate successfully at thirty or fifty pounds per square inch overpressure.

In late 1969, DRES installed one shelter, already the veteran of four blast tests, at a location calculated to experience fifty pounds per square inch in Event Dial Pack. The shelter was instrumented to record strains, motions, and inside overpressures in critical locations. A Ground Blast Simulator, which uses explosives in a layer of vermiculite detonated within a steel frame and under a water bag to simulate blast effects on buried structures, was developed by DRES on way, for a pre-trial test program during the spring of 1970.

A ventilation system using two EMO/DRES blast valves was provided.

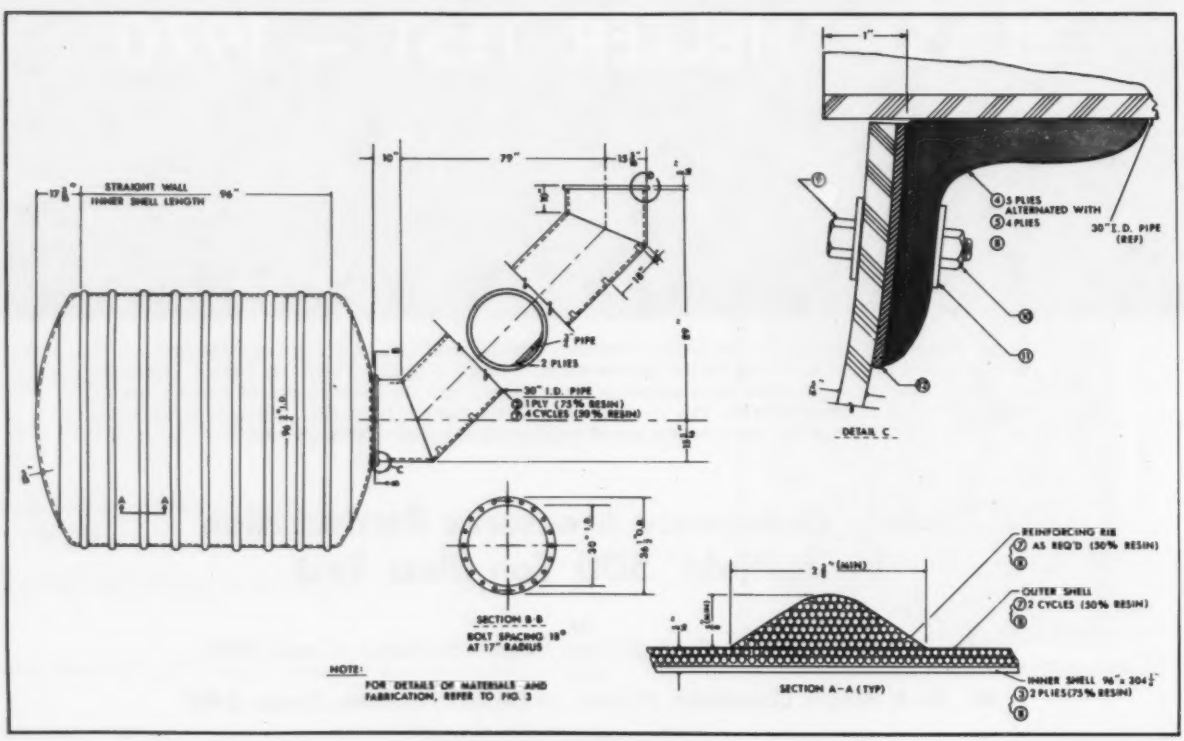

FIG. I CANADA EMO FIBREGLASS SHELTER MARK II
ELEVATION AND GENERAL DETAILS

The performance of the shelter located 500 feet from ground zero and exposed to fifty pounds per square inch overpressure from the five hundred ton explosion confirmed findings of simulated tests. Inside overpressure recorded was one quarter of a pound per square inch, a level below the threshold of pain for normal hearing and far below the minimum pressure which would cause burst ear-drums. This pressure level was the same as experienced by observers at a technical observation post, over two miles from the blast. The shelter received a small but acceptable crack in one corner. All components were operative after the blast and dishes remained on the table. The interior of the shelter is shown in Figure 2.

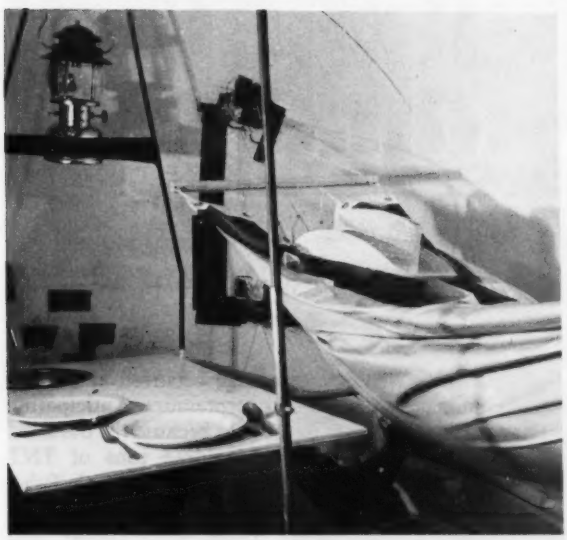

Figure 2

A similar shelter, buried 700 feet from ground zero and exposed to thirty pounds per square inch overpressure from the blast suffered no damage.

Multi-Purpose Communal Shelters

In 1963, the Canada Emergency Measures Organization engaged a consultant to develop a series of designs for dual-purpose communal fallout shelters, which would combine fallout protection with a peacetime function. These designs included a parking garage, a bowling alley, a curling rink, and a community centre. The objective of Canada EMO's work in blast resisting communal shelters is to modify these designs to make them multi-purpose, providing blast and fallout protection in addition to serving a peacetime function. It is anticipated that by improvements in technology, it will be possible to build such a multi-purpose shelter at a nominal additional cost over buildings designed solely for a peacetime function.

Three multi-purpose communal shelter projects were entered in Event Dial Pack: *Fibreglass reinforced plastic blast doors*, similar to those tested in 1968, were retested in a modified experiment; *four types of structural floor systems* were each tested at four pressure levels to investigate relative strengths at equal cost; *models of the multi-purpose shelter*, using the structural floor system which analysis had shown to be most economical were tested at the same four pressure levels.

Fibreglass Blast Doors

Since 1964, Canada EMO has been involved in analytical and experimental studies to develop a low cost blast door for communal shelters of fibreglass reinforced plastic. A change in mounting hardware plus unexpected blast wave reflection problems made the 1968 results for this project unsatisfactory. In Event Dial Pack, two doors were installed flush with the ground surface with one door installed at thirty pounds per square inch, and a second door at fifteen pounds per square inch. The door, shown in Figure 3, at thirty pounds per square inch was damaged but did not fail.

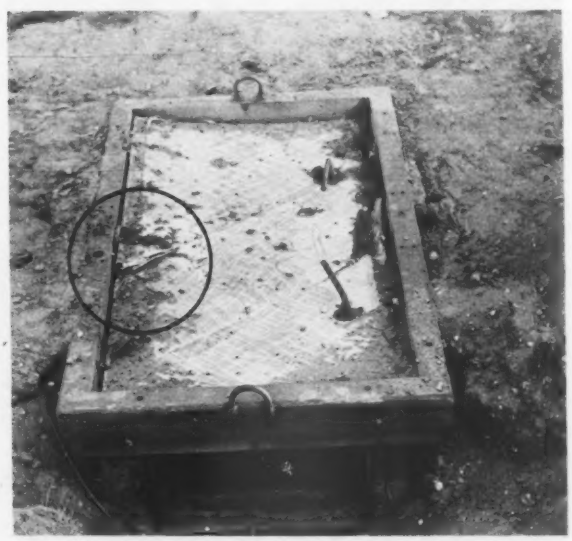

Figure 3

This rather fortunate result has defined the strength of the door more precisely than any previous test. The decision to locate a door at thirty pounds per square inch was based on the pre-trial tests and the success of this experiment again demonstrated the value of the pre-trial test program.

Structural Floor Systems

In order to develop a low-cost communal blast shelter design, it is necessary to develop an efficient structural floor system to resist the high vertical blast

loads on the shelter roof. Preliminary studies by Mr. S. N. White, Director General, Long Range Planning and Policy Development Branch, and formerly Chief, Protection Division of Canada EMO, and Mr. M. I. Zelman, Treasury Board, formerly Head, Blast Protection Section, suggested the use of a diagonal grid system, which is a reinforced concrete "waffle" floor where the beams are not parallel to the exterior walls. This recommendation was based on a preliminary analysis which indicated the more efficient distribution of stresses inherent in the diagonal grid system. An analytical study was initiated in 1966 to prepare detailed analysis of diagonal grid floor systems and the report on this study is expected to be published shortly.

To test the relative strength of equal cost designs, a number of test floor system panels were designed and tested. First, the results of the analytical study referred to above were used to design a diagonal grid system, see Figure 4, to resist a static load of six pounds per

Figure 4

square inch. Similar panels were designed, using equal weights of reinforcing steel, for the standard rectangular grid system shown in Figure 5, and for the T-beam system

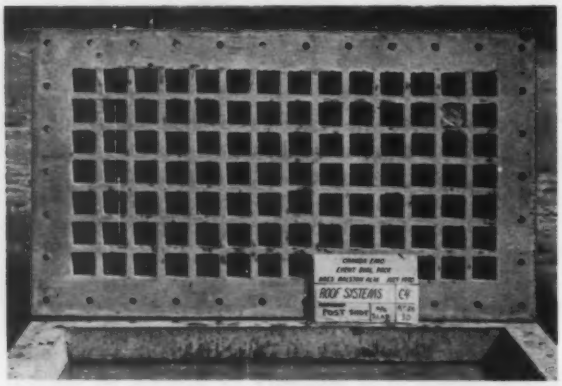

Figure 5

shown in Figure 6. A flat slab system shown in Figure 7 was designed to resist six pounds per square inch and, although more steel was used in it, its cost is similar to the cost of the other systems because of its lower formwork costs. Each of the panels was installed on a massive pre-cast concrete base, part of which may be seen in figures 4 to 7. One of the diagonal grid test panels was tested in the six-foot diameter Shock Tube at

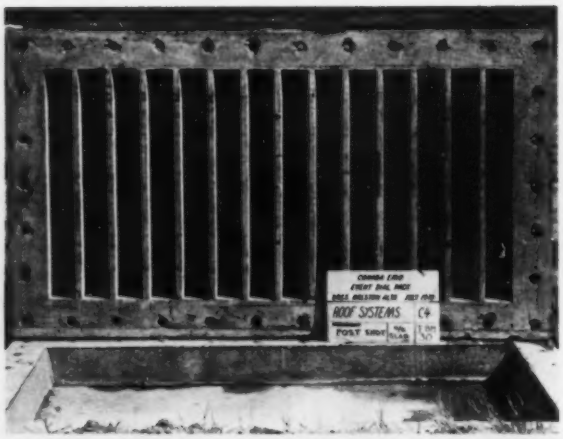

Figure 6

Suffield, where significant damage occurred at twenty-nine pounds per square inch overpressure. Anticipating somewhat more damage in the field because the duration of the blast wave from five hundred tons of TNT would exceed the duration obtained in the Shock Tube, one of each of the four panel types was installed at test distances where thirty, twenty-five, twenty and fifteen pounds per square inch should be expected.

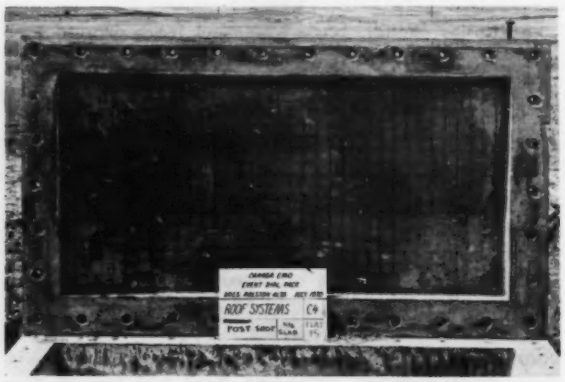

Figure 7

In the Suffield trial, the results validated assumptions of relative strengths. At all overpressure levels diagonal grid panel suffered the least damage. However, the

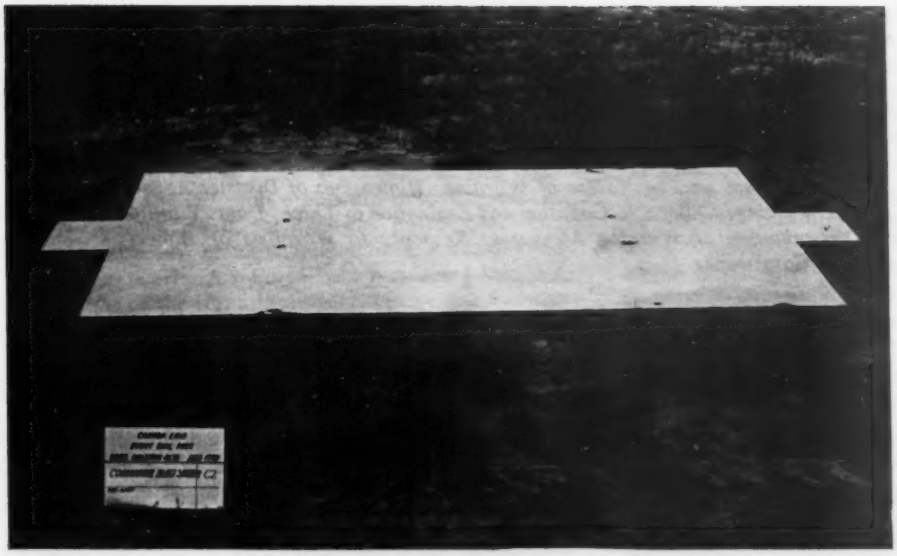

Figure 8

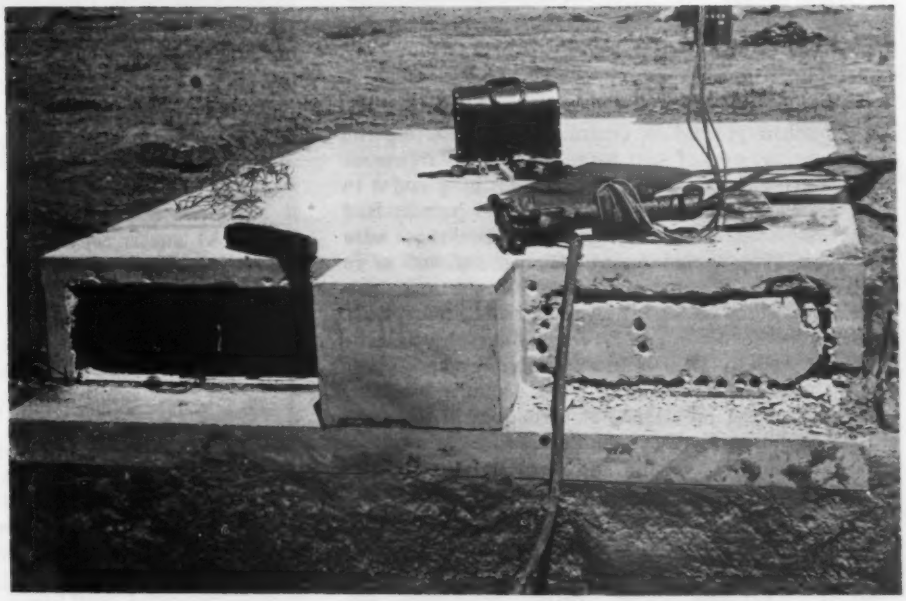

Figure 9

higher damage level expected did not occur. The co-orelation between field trial and shock tube experiments was excellent, indicating that more reliance can be placed in the future on the shock tube for structural evaluation.

Model Multi-Purpose Shelter Project

Since the response of a structure to blast depends on the interaction of its components, that is, its walls, floors, beams, columns, etc., the testing of the floor system is not an adequate test of a complete building. The dual-purpose parking garage-fallout shelter was selected as typical of dual-purpose configurations and a blast resisting design of it was produced. Four models of the garage were built at one-twelfth of full scale, and buried at the same test distances as the structural floor test panels (Figure 8). In order not to damage the models by lifting them after the blast, the ends of the models, see Figure 9, were opened and the underside of the floor slab photographed using a special trolley mounted camera and mirror.

(Continued on page 19) **BLAST SHELTER**

STUDY OF WARNING SYSTEMS

The following Appendix is extracted from a report issued in July 1970, by the Disaster Research Center, The Ohio State University. Produced for the Office of Civil Defence, Office of the Secretary of the Army, the study entitled "The Warning System in Disaster Situations: A Selective Analysis includes chapters on The Nature of Warning; Dimensions of Disaster Agents: CONSEQUENCES for Warning; Collection, Collation and Evaluation of Threat Data; Warning Decisions and the Dissemination of Warning Messages; Response to Warnings of Danger; Implications for Nuclear Catastrophe.

This is a case study, of the warning systems in Topeka, Kansas that were activated when a tornado hit that city in June 1966. The description and analysis is intended to familiarize the reader with the actual operations of warning systems in natural disasters. While the Topeka, Kansas stituation is somewhat more complex than most, for that reason it illustrates well the range of problems involved in preparing for and transmitting warnings when there is a major weather threat to a community.

Introduction

On Wednesday, June 8, 1966, several isolated tornadoes touched ground in central Kansas. During the early evening, one of two tornadoes in the area near Topeka ground a diagonal path 8 miles long and 4 to 8 blocks wide across that city of 128,000 people. Red Cross estimates indicated that 800 dwellings were destroyed, 810 suffered major damage, and 400 more received minor damage. Around 550 persons were injured, of which 85 were hospitalized. However, only 17 deaths were recorded. Property damage was estimated at $80 to $100 million, probably the highest dollar damage ever resulting from a single tornado.

Because of the prevalence of tornadoes in the state of Kansas during the spring and early summer months, elaborate warning systems had been devised for the city of Topeka, primarily through the local civil defense organization and the local station of the U.S. Weather Bureau. Three types of warning systems may be delineated in terms of the populations alerted in the event of impending severe weather conditions. An *intraorganizational* warning system is devised to inform members of a particular organization of the presence and progress of storm conditions. This organization may be part of a larger warning network, but the intraorganizational system itself is designed by and for the benefit of the particular group only. An *interorganizational* system is designed to alert those organizations which are particularly vulnerable to the damaging effects of a tornado due to the nature and concentration of people they involve (for example, schools and hospitals) or which have important functions in emergency stituations: for example, police departments, sheriff's officers, etc.). A public alert system is responsible for warning the "general public" as individuals.

During the tornado which struck Topeka, the intraorganizational and the public warning systems were highly effective, as evidenced by the low ratio between the number of deaths and the amount of property damage. However, certain phases of the interorganizational system broke down, and most of the organizational officials involved in this system were alerted to the storm conditions as members of the public. This study examines all three types of systems and attempts to indicate the reasons for the ineffectiveness of the interorganizational warning system.

The Warning Systems

In skeletal form, the Topeka tornado warning system is represented in figure 2.

The Topeka Torado Warning System

Interorganizational	*Intraorganizational*
(1) Weather Bureau teletype networks	(1) Citizen's band radio club storm watch lines
(2) Weather Bureau back-up calling list	(2) Radio Station A, mobile unit system
(3) Telephone hot line (prior to the siren sounding)	(3) Sheriff's civilian weather watchers
(4) Back-up telephone chain (after sirens have sounded)	(4) Police watch system

Public

(1) Sirens

(2) Radio and television

FIGURE 2

We will now discuss each of these separately.

Interorganizational Alert

A statewide weather bureau teletype system, including the weather station at the Topeka Municipal Airport, is monitored by the local radio and television stations, the city police department, the county sheriff's office, and the local post of the state highway patrol. The local weather bureau supplements this network with a telephone calling list. Notified by the bureau over normal telephone lines are nine radio stations outside

Topeka which do not have weather teletype monitors; the superintendent of schools, notified both as a precautionary measure and in preparation for the possible use of schools as future evacuation centers; a local citizen's band radio organization; and a local ham radio operators' club.

Under the direction of Civil Defense, a "hot line" system links the city police and fire departments, the county sheriff's office, the highway patrol post, and Civil Defense over direct telephone lines. An additional line to the nearby Air Force base was being installed at the time of the tornado disaster. Under this hot line system, the first agency notified of severe weather conditions or of a tornado watch will relay this information to the other organizations. The purpose of this network is to insure that all these governmental agencies are aware of weather conditions as reported by the weather bureau in advance of any siren sounding.

Finally, after the public alert sirens have been sounded, use is made of a back-up telephone fan-out system by Civil Defense. Its purpose is first to insure that certain organizations have heard the sirens and secondly to see that these sirens have been correctly interpreted as warning of an immediate threat of tornadoes to the area. The three primary categories (sheriff, police, and radio-television) would have already been notified by the weather bureau teletype monitor, but confirmation of the actual presence of a tornado is given by telephone from the airport weather station. Apparently, the police department would be the first organization called by the weather bureau since it sounds the city-wide Civil Defense sirens. (As in all the ensuing phases of the chain, the legitimacy of the calling party is confirmed by use of a prearranged code name which is to be given only in the event of a tornado alert. Separate code names have been assigned all the organizations in this chain.) After the tornado alert has been verified by the weather bureau and the sirens have been sounded, the police department places five calls which actually initiate the back-up chain. Each agency in turn, after receiving the telephone alert and satisfactorily confirming its legitimacy, places additional calls until all the listed organizations have been contacted. All telephone communications, including the initial call from the weather station to the police, are handled by normal switchboard lines, but many through unlisted numbers.

In addition, it should be pointed out that many organizations have facilities for receiving communications other than those needed in these warning systems. For example, the fire departments, some radio and television stations, and at least one hospital have police radio monitors. Also, some have worked out smaller warning networks of their own as a kind of back-up to the back-up chain.

Intraorganizational Alert

Perhaps the most interesting organization involved in tornado warnings in Topeka is the private citizen's band radio club. This local group, using privately owned equipment, has developed, with the aid of local weather bureau personnel, a storm watch system whereby five members in cars equipped with mobile radio units are sent to prearranged positions on one of nine stormwatch lines. These five line units are positioned at distances of 5 miles (due to the limited range of their equipment), thus extending 25 miles from their central control station. Also, another base unit, which is in contact with central control and thus with the 5 field units, is located immediately adjacent to the radar screen at the airport weather station, enabling a club member to communicate simultaneously with members of the watch line and observe weather patterns on radar.

A local commercial radio station (Station A) also has a prearranged mobile alert plan. When it is apparent that severe weather conditions are in fact in the area, four station personnel, in mobile units equipped with radio apparatus for contacting the station and for broadcasting "on-the-spot reports" directly, are dispatched in four directions. When one of the mobile personnel sights an actual formed cloud, the station interrupts its programming to allow the reporter to broadcast what he is seeing and where, where the funnel cloud is heading, and what areas should take cover. Of course, at this point the system has become a public alert system, but the purpose of the plan itself is to keep the broadcast personnel at the station informed so that they in turn may pass this information on to their listeners.

The sheriff's office has enlisted the services of twenty to twenty-four civilian weather watchmen throughout the county, all of whom reside outside the city limits. The watchmen notify the weather bureau and the sheriff's office of the presence and progress of storms in the area. Also, the city police department dispatches five patrol cars into different parts of the city to observe and report on weather conditions as a part of its weather watch.

Public Alert

As mentioned previously, Topeka radio and television stations have weather teletype monitors, and some also monitor the police radio. Information gathered from these sources concerning weather conditions is passed along to the public as a part of their normal programming. In addition, radio Station A has specific preplanned devices and procedures which it enacts during a tornado watch. Whenever this station receives a tornado watch bulletin, it first begins what is termed a beep system. This involves the superimposition of five recorded beeps every two minutes over the regular programming. In addition, any statement from the weather bureau is read every fifteen to twenty minutes. When one of the mobile reporters assigned to a weather watch location sights an actual tornado, a recorded siren sound is broadcast, interrupting the actual programming. This siren tape includes a recorded voice announcing that this is a tornado alert, followed immediately by the remote broadcast.

Other radio stations also have specific, but less extensive, procedures. For example, one station which originates separate AM and FM radio broadcasts as well as television switches to "simulcast," whereby all three stations carry the same emergency programming.

In Topeka, the Civil Defense sirens represent the central mechanisms for warning the public. There are nineteen sirens located through the city in addition to one operated by the railroad shops and one by the Air Force base. The city police department is the only agency which can sound the public sirens and is responsible for doing so when a tornado, verified by the weather bureau as representing an imminent threat to the community, is sighted in the area. The police department is also responsible for alerting the railroad so that they may sound their siren at the same time. To the public, the sirens are intended to mean that there is immediate danger of a tornado and that cover should be sought at once. After the sirens have sounded and the threat of a tornado has ended, the "all clear" is given only by the commercial radio stations.

Warning Systems in the Disaster

On Wednesday, June 8 at 11:00 a.m., the U.S. Weather Bureau teletype carried a tornado bulletin placing the Topeka area under a tornado watch from 2:00 p.m. until 8:00 p.m. Throughout the afternoon, the teletype carried reports of isolated tornadoes touching down and of tornado damage in the countryside. For example, at 3:09 p.m. an isolated tornado touched down in the country 160 miles southwest of Topeka. At 5:25 p.m., another tornado damaged farm buildings in an area 80 miles due west of the city and was reported traveling in a northeasterly direction, away from the Topeka area.

At 6:05 p.m., weather bureau radar at the airport picked up two separate storm cells (i.e. the circular configuration observable on the radar screen as a result of an electronic "echo" from a storm), one to the southwest and another to the northwest. The northern cell appeared to be the stranger of the two, a suspicion strengthened by reports of a funnel cloud 54 miles north-northwest at 6:30 p.m. moving away from the area in a northeasterly direction. At 6:50 p.m., the weather teletype carried a notice of heavy thunderstorms moving into the western edge of the area, but as late as 6:58 p.m. the strongest activity visible on radar was still to the northwest. Then, at 7:00 p.m., a call from the airport tower advised the weather station of a dark cloud to the southwest. At this time, three telephone calls were received from private citizens reporting a funnel cloud southwest of the city. The weather bureau began to scan the southwest area closely, and two minutes later (7:02 p.m.), a hook appeared on radar in an area 7 miles southwest of Burnett's Mound (located on the southwestern fringe of the city). Moving into the city in a northeasterly direction at an estimated 30 miles per hour, the tornado crossed the Mound (despite Indian legends to the contrary that no tornado would ever cross the mound), inflicting heavy damage in an area of apartment houses at 7:18 p.m. Remaining on the ground as it continued its diagonal path through the city, it passed through the Topeka Municipal Airport, exiting from the northeast edge of the city at 7:30 p.m.

At 11:00 a.m., all organizations monitoring the U.S. Weather Bureau teletype system had been notified of a tornado watch for the Topeka area. At that time, the local weather station promptly relayed this information to the organizations on its supplemented calling list. Throughout the afternoon and evening, the teletype reported on the progress of storm conditions, including the radar sighting of the two storm cells. Apparently, the police department took the initiative and relayed the teletype information they were receiving to the other agencies connected by the hot line network. In this manner, the fire department, the sheriff's office, the local highway patrol post, and Civil Defense were advised as to weather conditions between 11:00 a.m. and 1:00 p.m. Additional contacts were made during the afternoon, as indicated by the fact that police informed the highway patrol of strong thunderstorm activity in an area 54 miles northwest of the city at 5:24 p.m.

As evening approached and weather conditions grew worse, various agencies began to enact their intra-organizational alert systems. Radio Station A initiated its beep system at 2:00 p.m., coincidental with the tornado watch period and broadcast the latest information from the weather teletype at regular intervals. At 6:30 p.m., because of the wind and heavy rain outside their studio, the station dispatched its four mobile units and switched to emergency power. At 7:00 p.m., the mobile reporter atop Burnett's Mound reported a tornado southwest of his position, and immediately the station played its recorded siren, followed by the broadcast from the reporter at the scene. This required that the station interrupt another Kansas AM station with whom they share broadcast time between 7:00 p.m. and 7:30 p.m. Their remote broadcast reportedly preceeded the official teletype notification from the weather bureau as well as the sounding of the public alert sirens. At 7:10 p.m., the mobile reporter radioed that the tornado had hit the Mound and that he was proceeding to follow it into the city when contact with him was lost.

The citizen's band club had received notification of the tornado watch at 11:00 a.m. as part of the weather bureau's supplemented calling list and set up their standby units. At 2:00 p.m., the weather bureau called again to report that weather conditions were growing more severe, at which time one of the club members was sent to the weather station to standby his radio there. At 5:00 p.m., after observing the radar screen, this member sent out other club members on the weather watch line which was most likely to sight an approach-

ing tornado. About 7:00 p.m., the observer stationed on Burnett's Mound sighted the funnel cloud and, while fleeing from the area in his car, radioed the weather station and requested that they notify the police to sound the public alert sirens immediately.

Also, as the storm was approaching, the county civilian weather watchers were reporting to the sheriff's office and to the weather station. They continued to do so until the high winds ended telephone communications. As mentioned above, the Topeka Police Department made use of the hot line system during the afternoon. When the 3:00-11:00 p.m. communications shift reported for work, the tornado watch bulletin was rebroadcast to all police cars during the half hour between 4:30 p.m. and 5:00 p.m.

The police communications section consists of two rooms: the dispatch room and the switchboard operation room. Normally, two regular police dispatchers are on duty in the dispatch room, but one from the 3:00-11:00 shift was on vacation June 8. His position was filled by a part-time summer employee who had previously worked in the communications section but never as a dispatcher. The switchboard was manned by another part-time employee who had only been working in the department for a week.

At 6:00 p.m. the patrol lieutenant came into the dispatch room and represented the ranking officer on duty at the time of the emergency. At 6:40 p.m. the dispatch officer returned from the switchboard room where he had just read the teletype report of a tornado passing through a community 54 miles to the northwest. He informed the patrol lieutenant of this whereupon the lieutenant decided to dispatch the five patrol cars on a weather watch. After the cars were deployed, the dispatch officer decided to radio an officer on patrol, who had some prior experience as a dispatcher, to report to the station and assist in the radio and switchboard rooms. This officer arrived shortly thereafter.

At 7:00 p.m. the unit assigned to weather watch duty on Burnett's Mound radioed that he had sighted a funnel cloud approaching the city from the southwest. At this time, the dispatcher instructed the patrolman who had just arrived to place the warning calls listed in the warning plan while he himself placed a hot line call to the weather station notifying them of the tornado sighting. Apparently, the weather bureau was attempting to phone the dispatcher at the same time, after having picked up the hook on radar, and took the opportunity to advise him to sound the sirens. Immediately, the dispatcher went to the switchboard room, removed the protective cover from the siren button showing the patrol lieutenant what had to be pressed, and returned to the radio room. While the lieutenant was sounding the siren (at 7:04 p.m.), the dispatcher notified a local ambulance service (not a part of the warning system) of the situation and assumed they would notify all hospitals over their direct telephone lines. By this time, traffic on the police radio, which only this officer and the part-time employee were manning, was increasing rapidly as reports of the tornado, the damage it was causing, and the areas in need of assistance began to pour in.

Meanwhile, the patrol lieutenant, after setting off the sirens, apparently noticed the other officer in the process of alerting organizations on the back-up list and advised him to get into a patrol car and head for the section of apartment houses where the tornado was just reported to have struck. The officer stopped his calling and left immediately. Thinking of the casualties that would result from the disaster, the lieutenant went to a place on the floor above and called the supervisor of the large general hospital (Hospital A), informing her of the tornado and advising her to prepare to receive casualties. He attempted to call another (Hospital B), but someone else in the building was dialing on the same outside line, so he returned to the patrol office where he was able to contact Hospital B and relay the same information. Next he called a radio-television station, requesting that they broadcast a notice for all off-duty policemen to report for service. He was attempting to call another station when telephone service at police headquarters was lost.

The fire department had been notified of the tornado watch early in the day by both the teletype bulletin and the hot line call from the police department. However, their first knowledge of the actual tornado came when the public sirens were sounded, at which time the police radio monitor was turned up and the officer on Burnett's Mound was heard describing the direction of the funnel cloud.

The sheriff's office, in addition to the storm messages received by teletype and hot line, was continually advised of the progress of the tornado by its civilian weather watchers until phone service was discontinued. They were not contacted through the interorganizational back-up chain.

The local highway patrol post initially learned of the watch by teletype and hot line, and by means of the latter were continually informed of weather conditions by the police department throughout the afternoon. When the sirens went off in Topeka, the patrol radio officer went to the weather teletype but found no tornado information on it. He then phoned the weather bureau by direct hot line and they verified the tornado alert. Immediately he sounded the tone alert over the radio and broadcast to all highway patrol units that Topeka was under a tornado alert, after which he put the message on the statewide teletype.

Civil Defense officials learned of the watch from the police hot line call at 11:45 a.m., but when the tornado struck their only warning was the public sirens. CD was not contacted as part of the back-up chain. When officials began arriving at CD headquarters, their own fan-out calling system was initiated to call in members for emergency service.

Of all the organizations which comprise the siren back-up list, perhaps the most important is the county medical society. The two-man staff of their organization learned of the possibility of tornadoes through

radio and television. As the tornado was approaching the city, the society's switchboard operator was watching the emergency announcements on television and hence was aware of the situation. But she received no call from the police department and did not feel that it was her responsibility to telephone the seven hospitals and clinics on the calling list without official notification from the police as the warning plan specified. Therefore, the society placed no calls to the hospitals listed.

The second major link in this chain is the school system. Since the disaster occurred in early June, regular school sessions were not threatened by the tornado as classes had already been dismissed for the summer. However, summer session had just begun, and partly for this reason the superintendent of schools was contacted by the weather station when the tornado watch had been issued. At the time the funnel was sighted approaching the city, classes had been dismissed for the day. Thus the school superintendent (and hence the other education officials in the remainder of this phase) received warning only as part of the regular citizenry.

Hospital A, although it did not receive a fan-out call from the medical society, was contacted by the police patrol lieutenant. However, this occurred at the same time as the tornado was entering the city, immediately after which the hospital's phones went out. Thus, they were unable to relay the warning to Hospital E, their responsibility under the fan-out system.

Hospital B apparently experienced some difficulty during the pre-impact period. Through the radios and televisions to which its patients were listening, the hospital's staff had become aware of the tornado watch and, later, of the severe weather conditions. However, when the sirens were blown, it was not clear whether or not this signaled the immediate threat of danger. But from the information gathered from radio and television broadcasts, it was decided to interpret the siren warning as signaling immediate danger and emergency preparations were initiated. At this time, the patrol lieutenant was having difficulty getting an outside telephone line, and by the time he was able to contact the hospital supervisor the tornado had already struck in the area. Apparently, when hospital officials decided that the sirens meant imminent danger, they placed their assigned warning call without waiting for one to reach them.

The staff at Hospital F had gradually become aware of the tornado watch from the radio during the latter part of the afternoon. However, they received no other warnings until the sirens were heard and right after this the back-up call from Hospital B. But in addition to the systems already described, Hospital F had developed a separate plan to insure that two other institutions in the area had also been warned. A car, equipped with a mobile citizen band radio unit, was to be sent from the hospital to Clinic C, which would send a similarly equipped car to Hospital E, which in turn would send one back to Hospital F. However, at the time of the June 8 tornado, the car from Hospital E did not arrive, and if it had, Hospital F had no operational equipment of its own to complete the chain.

The staff of Hospital E also had gradually learned of the watch from the radios to which patients were listening during the afternoon. At the time of the siren sounding, both the administrator and a secretary were listening to radio Station A; thus there was no doubt regarding the meaning of the siren alert. Emergency procedures were implemented immediately. The hospital received no back-up call nor did it attempt to contact Clinic B.

Finally, the patients of Hospital C were also listening to radio Station A, and the staff became aware of the watch during the course of their normal afternoon routine. In addition, one staff member is assigned to monitor police radio communications and was thus able to relay weather information from this source to other personnel. Hospital C experienced no difficulty in interpreting the meaning of the sirens, but there was some question concerning the source of the "all clear" notice. Hospital personnel interviewed were uncertain who was to call them in the back-up chain and did not receive a call in any case. No call was placed to Clinic A apparently because after the tornado had struck they were unable to place out-bound calls.

Conclusion

For the population of Topeka as a whole, the general impression is that the warning systems were adequate and that the low number of recorded deaths can be attributed to the effectiveness of the public warning systems. But effectiveness in turn is dependent on other factors. Some of these were peculiar to Topeka, or at least operative only in similar communities. Other factors would have played a part in any community threatened by a similar kind of disaster.

As indicated earlier, Topeka is in a highly tornado prone area of the country. It is clear than an elaborate tornado disaster subculture has emerged in response to this condition. A complex organization and technology, along with corresponding attitudes and values, is present among the residents and organizations of the city. There is not only an elaborate pattern for sensitizing the community to a particular kind of danger but equally as important, there is widespread knowledge about the appropriate course of action to follow when certain cues are presented. Many another area in the country has been flooded with as many tornado watch bulletins and other weather information as was Topeka, but the organizational and individual response has been of a different order. It was less the advance notices —necessary as they were—that was crucial but rather than Topeka is psychologically and socially prepared for tornadoes whereas other localities are not.

Furthermore, the planning and preparation for this kind of disaster, particulary mechanisms for detecting its approach, are rather elaborate in the Topeka area. A great number of different groups search for danger

cues, and several of them almost simultaneously—but independently—sighted the tornado in this particular instance. There are even two separate ways for alerting the general public, with the less official one of the radio station apparently sounding an alarm in this emergency before the police triggered the sirens. Moreover, because of the multiplicity of danger-detecting groups, there is a high probability that more members of the general public will become aware of a potential threat than would be the case if fewer organizations were involved. The somewhat noncentralized and multiple in-depth warning systems against tornadoes in Topeka is very complex. In fact, few organizational officials probably could spell out all the details of the systems as they are set forth in this report. Nevertheless, the different ways of learning about a particular kind of danger serves the community well.

The time at which the actual tornado struck the city allowed maximum dissemination of weather information. The period between 6:00 p.m. and 7:30 p.m. is traditionally devoted to news and weather broadcasts on the media of mass communication, particularly television. A majority of the population of Topeka, including a large part of the personnel of organizations most involved in emergency situations, reportedly received weather and tornado information from these means during the course of their evening meal. This information left little doubt as to the meaning of the sirens when they were sounded at 7:04 p.m. Even though there was some later question regarding the delay by the weather bureau in confirming the presence of the funnel cloud on their radar, it seems that there was a minimum of ten minutes between the time the sirens were subsequently set off and the tornado moved into the southwest portion of the city. Admittedly, this period was shorter for those persons living outside the city itself in the southwest fringe area if in fact they were able to hear the siren warnings. But the period also was longer for those residents in the central and northeastern portions of the city.

The intraorganization warning systems made important contributions to the public warning systems. The citizen's band club's weather watchers, the sheriff's county weather watchers, and the police tornado watch personnel furnished the weather bureau with confirmed tornado sightings and information on the progress of the funnel. This information was particularly important in increasing the time period between the siren sounding and the striking of the tornado. Also, radio Station A's mobile weather watchers enabled that station to broadcast to the public immediate information on the approach and the possible path of the tornado.

The personnel of most organizations on the interorganizational telephone back-up chain (except the police department and sheriff's office) received warning only as members of the general public, due to the breakdown of this chain. In most cases, the sirens were heard and their meaning was clear, due largely to the reinforcing information from radio and television. The overall interorganizational warning system worked well in informing organizations of adverse weather conditions in the afternoon, but was largely inoperative in warning of the imminence of danger or confirming the reason for the siren soundings.

For these latter tasks the pivotal point in the system is the police communications section. However, it encountered three difficulties in the June tornado. First, some relatively inexperienced personnel were on duty, although the dispatch officer attempted to compensate for this as soon as the police weather watch was established by requesting an experienced patrolman to come to the station to assist in the radio and switchboard rooms. Second, the threat quickly became a realtity; thus, as soon as it was known that the tornado had hit in the apartment house area in the southwestern part of the city, the urgent need of obtaining additional information about that seemed to have higher priority than warning about possible danger. In a way, the stance changed from preparing for to responding to an actual disaster. This was manifest in the attempt to substitute the fan-out warning calls with direct notification of probable casualties to the city's hospitals. Third, the usual rapid increase in volume and urgency of intra-and extraorganizational as well as public calls converging on the police after the impact of a disaster agent, effectively tied up communications personnel and quickly precluded any further attempt to activate the fan-out system. This probably would have been true even if the phone lines had not gone out. There were all these difficulties but, nevertheless, the police without delay did sound the sirens as soon as they had confirmation that a tornado heading for the city was sighted. This all-crucial aspect of the warning system worked exactly as planned.

Although they did not manifest themselves in this emergency, some other possible difficulties in the operation of the systems suggested themselves. For example, it seems fairly clear that both the watch and the alert process will not work as well in other than daylight hours, particularly if the danger first develops in the middle of the night. Then too, the back-up and fan-out systems are heavily dependent on the availability of phones. The various systems allow a degree of discretion regarding decisions both as when to initiate watching for threat cues and alerting for danger, that could prove troublesome without continous organizational coordination. Finally, there is evidence that some organizational personnel simply took nominal actions during the watch period and did not really gear themselves for a potential disaster.

Nevertheless, when all is said and done, the overall warning system in Topeka worked in June of 1966. The police sounded the sirens in time. Most other relevant organizations in the city were aware in varying degrees of the tornado watch. The city as a whole was warned in enough time to save lives despite extensive property damage.▲

"HOT LINE" TO THE PEOPLE

Radio's Response to Disaster

by

Bob Nash, Assistant Manager, KFYO Radio

LUBBOCK, TEXAS—"You run a bigger risk of being killed by a dinosaur than by a tornado," has pretty well summed up the feelings of the 150,000 residents of Lubbock, Texas for years. The night of May 11, 1970, changed that philosophy forever.

Lubbock residents got a front-row seat at a full-blown tornado on Easter Sunday in 1957, a funnel that stretched from a black sky to the ground just long enough to be viewed by nearly every person in town before it dissolved into a cloud that spewed the city with heavy rain and hail. But even this close look at nature's most awesome killer did not prepare Lubbock for what was to come 13 years later.

May 11th was just like any other spring day on the South Plains. It was rather warm that Monday, but the weather forecast did not call for any record-breaking temperatures or for any rain for that matter. It was another busy day at KFYO Radio.

Weather Plan Ready

The KFYO severe weather operating plan, which we had written in 1967 (just after the FCC had liberalized the rules and procedures relating to the use of EBS facilities in emergency weather operations). was neatly filed away. KFYO Radio had been made this area's primary EBS station through National Defense Emergency Authorization by the FCC in March of 1965. The KFYO weather plan had been discussed briefly by key personnel when Lubbock entered the "bad weather" season in the middle of April. The review was short and limited in scope since we knew what was in the plan and who was involved. We had manned the Civil Defense Emergency Operating Center in city hall during many weather "scares."

At the close of the business day on May 11th, the staff scattered to various areas of the city for dinner and relaxation.

As the evening wore on, the Lubbock Weather Bureau issued a radar summary at 7 p.m. noting a moderate thunderstorm about 12 miles southeast of Lubbock. The report said the storm was moving to the northeast, a direction that would take it away from Lubbock.

City Staff Alerted

Five minutes later, the Weather Bureau called Civil Defense Director Bill Payne to tell him that a severe thunderstorm warning would be issued for the Lubbock area by 7:30 p.m. The call was a part of a prearranged plan between the city and the Weather Bureau. Payne at that moment was speaking to an Optimist Club meeting in southwest Lubbock . . . and showing a tornado film. He was tracked down by telephone and given the message. As soon as he finished his speech, he returned to city hall and immediately instituted the Personnel Call Section of the city's civil defense plan.

The time is now 7:50 p.m. and the scene is a warm convivial gathering hosted by Lubbock firemen. Among those in attendance are City Manager Bill Blackwell, Fire Chief Hershell Sharp, and KFYO News Director Max Mott. Blackwell is called to the phone and apprised of the latest weather news by Bill Payne. This call is not unlike the several dozen calls on severe weather that Payne has made to Blackwell over the past two-and-a-half years. Payne reports he is at the EOC and that weather conditions are turning sour. Weather Bureau radar reports show a severe thunderstorm just east of Lubbock.

The sky is ominous . . . a green-black color. Reports are coming in that hail the size of golf balls to the size of grapefruit has begun to fall just south of Lubbock. Max Mott leaves the party and drives to the station in downtown Lubbock. Already at the station are Bill Reynolds, Gary Williams, and Bud Andrews.

Radar Spots Tornado

The four men hold a briefing session, as they have done many times in the past, about the rapid weather developments. Mott then goes across the street to the civil defense Emergency Operating Center in the basement of city hall, turns on the EBS two-way radio equipment, and stands by. The weather teletypes at the EOC and the KFYO studios are chattering message after message.

KFYO now drops its regular programing and goes under its Severe Weather plan mode. At 9:05 p.m. KFYO broadcasts a Weather Bureau tornado warning that a tornado is indicated by radar just south and east of the city. The radar shows strong cells all over the city.

Downtown Lubbock is darkened by tremendous clouds. Gale-force winds are hitting at areas in southwest Lubbock some six miles from the downtown area.

Meanwhile, KFYO is still on the phone with KRLD in Dallas. The Dallas station had called earlier when Lubbock was placed under a severe thunderstorm warning. The Dallas people were told that the weather situation in Lubbock was developing rapidly and would they like to "hold"? Hold they did, and the line stayed open to Dallas while the tornado tore the heart out of Lubbock. It was through this link that the outside world first learned of the Lubbock Disaster.

Take Cover

Shortly before 9:45 p.m., KFYO's Bud Andrews, listening to the police monitor, picks up reports of houses and buildings just northwest of city hall disappearing as if by magic.

"Take cover!" Bud yells into the KFYO microphone.

With all its fury, the tornado smashed into downtown Lubbock. Electric power is severed over a vast area of the city. Thirty-thousand telephones are on their way out. Twenty-six persons will die from injuries sustained in the next few moments.

The KFYO studios shuddered . . . a window smashed on the north side of the building. A house just behind KFYO was scattered like straw. A building to the south was torn in half and its contents of automobile tires thrown everywhere. But the civil defense emergency power generator was started, and the lights glowed in the KFYO studios.

City Government Responds

Max Mott at the EOC tried in vain to make his first report of the storm. The antennas atop city hall had been stripped away by the fantastic winds. Our electronic between the EOC and KFYO was gone since city hall telephones were also inoperable. But we made our nearby studios available to Lubbock officials. Soon Mayor James Granberry and City Manager Blackwell were making frequent trips across the debris-laden street to make broadcasts about the nature of the storm, the immediate problems facing the city, and instructions to the people.

Within an hour our communications problem was eased when we canabalized our mobile news unit of its transmitter and rigged it up in city hall to provide a direct link between the EOC and KFYO studios.

Meanwhile, the city government was running like a well-oiled machine, thanks to a civil defense plan which had been carefully worked out and revised over the years. Word was broadcast by city officials that the devastated area would be sealed off to prevent looting and interference from sightseers. Fire department rescue teams combed each house, each building, each wrecked car for injured and dead.

The Official Voice

An unbelievably large load of personal messages was handled by our short staff in addition to information from city officials. We broadcast hundreds of personal messages in the first hours after the storm. As part of our emergency plan, KFYO was on daytime power, 5000 watts, and our voice was being heard all over the southwest. Later we learned that scores of families in Texas. New Mexico, Oklahoma, and as far away as Nevada learned that their loved ones were safe through messages broadcast on KFYO.

As police and fire department teams continued their block-by-block search of Lubbock, they relayed reports to the EOC defining the devastated area. By taking these reports and plotting them on the city map at the EOC, we were able by 1 a.m. to tell the world what damage had been done, the specific areas, the known dead, and the approximate number of injuries.

The Red Cross and Salvation Army opened Lubbock's Municipal Coliseum as a shelter for the homeless. This information was aired and volunteers were urged to man stations at the Coliseum. Food became an immediate problem, and appeals were broadcast for sandwiches, milk, nonperishable foods, and baby foods.

Cots were brought in from Reese Air Force Base, from the various Reserve units, and from Red Cross as the dazed, bewildered men, women, and children filed into the Coliseum for shelter, first-aid care, food, and dry clothing.

Debris Everywhere

During the early morning hours of May 12th, emergency sessions of the city council were broadcast as a matter of course. Army Reserve personnel were assigned to the EOC, and we broadcast instructions to various reserve units as to when and where to report.

Instructions, warnings, pleas . . . all through the night these were aired on KFYO via our link to the EOC at city hall.

As daylight illuminated the landscape on May 12th, none of us could believe what we saw. A north wall of the police station had been toppled. The southwest corner of city hall was caved in. There was hardly a window spared in city hall. A 30 by 40-foot section of roof from some building had been deposited in front of KFYO.

From the back of our studios one could see destruction in every quarter. Our newest bank building looked as though a giant shotgun had blasted most of the windows on the north side. A 20-story building within three blocks of the studio had its face brick ripped from about four floors. Window glass literally carpeted the downtown area.

Fourth Army personnel arrived in Lubbock about 9:30 a.m. on the 12th, bringing with them two giant helicopters. National and State officials were on their way to the city. A vast part of central and north Lubbock was sealed off even tighter as a bright sun bathed the ugly wreckage.

I Don't Believe It

Viewing the scene from a helicopter, city officials to a man remarked, "I see it but I don't believe it."

During the day, KFYO broadcast interviews with Senator John Tower, Congressman George Mahon, Texas Lt. Governor Ben Barnes, National Civil Defense Director John Davis, and many others.

Emergency messages from private citizens were being handled as quickly as possible over our microphones. Business houses called in instructions to their employees. Meetings were being cancelled and the word was being sent out.

When midnight May 12th arrived, KFYO finally went of the air to resume regular commercial broadcasting

at 5:30 a.m. on the 13th. Since 8:55 p.m. on the night of the 11th until midnight May 12th, KFYO had not broadcast one commercial message. The entire facility had been given to the city. And even when we resumed commercial broadcasting on the 13th, most of the programing had to be thrown out so that we could keep up with the continuous stream of information and instruction from city officials.

The Plan Worked

Looking back at our disaster operation, we at KFYO can see places where improvements can be made, and we're making them. But one thing we do know: Our emergency weather plan worked. Our people knew what to do and how to do it. Conjecture, rumor, opinion, or hearsay were never used by KFYO personnel in our emergency broadcasts.

KFYO knew of the city's civil defense plan and the city knew of KFYO's plan. We had worked them out together. We knew what to say and where to get our information in the civil defense Emergency Operating Center before and after the storm.

For 27 hours we provided the government of Lubbock with a "hot line" to the people. It worked because many people had prepared to make it work. As I see it, that's what civil defense is all about.▲

MAKES GOOD SENSE

LUBBOCK, TEXAS—William J. Payne, Director of Civil Defense for Lubbock, Texas, comments on the value of civil defense in the aftermath of the tornado the night of May 11, 1970, that smashed into his city of more than 150,000 people:

Sometime the next morning after the tornado had struck I said to myself—what in the hell would have happened to this city if we had not had a civil defense program? And I am speaking here very specifically about the same program that is for nuclear attack.

We would not have had an Emergency Operating Center.

We would not have had a communications system.

We would not have had a plan.

We would not have had knowledge programed on what we should do if things like this happen.

This isn't unique to Lubbock, Texas. Communities in our Nation are under a terrific amount of stress. If you just overlook the nuclear attack possibility, for example, you get into civil disturbances, you get into power outages, you get into severe weather.

There is a great need in the complex society we live in today to be prepared to cope with these occurrences, and the civil defense program really is the only thing in the Nation that provides a community with a capability to cope with these problems.

Civil defense to me is emergency planning and resource management. You can't build a structure for this that is separate and apart from local government. Local government has the problem today and it is going to have it tomorrow. And when an emergency occurs, it will have the problem in spades.

I think you will find more and more cities will get into an operation like this. I think the times will demand this. It makes good sense.

PEACE RESEARCH – THE SCIENCE OF SURVIVAL

From The UNESCO Courrier—Nov. 70

by
*Bert V. A. Röling**

War was long regarded as a scourge of God, as a means of chastising mankind. The London City Council in 1665, for instance, considered the plague epidemic afflicting their city as an atonement required by the Lord for the impious writings of Thomas Hobbes.

Only when war was seen as just another facet of human inadequacy could it become the subject of scholarly contemplation. The first branches of learning to regard war as man-made were theology, ethics and jurisprudence. However, each of these naturally tended to take a normative view, to set up standards of rightness and wrongness.

The study of war and peace as an objective branch of learning could only begin at a rather late period in history, when scholars no longer sought to set up judgements, but rather sought to examine war and its causes with the objective of understanding the factors and relationships that play their parts. The first contributions were made by historians, political scientists, economists and sociologists.

The First World War had already made it clear that war had ceased to be "limited", mainly involving armies, and had become "total", involving the entire population of a nation.

The Second World War added a new dimension by the introduction of nuclear weapons. Total war has now evolved into its ultimate state: annihilating war.

This is the problem of our times: war has now become unendurable, but the relations between the states, the international system, have remained the same. We still have sovereign states which seek security in their own military power and want to ensure peace by "deterrence", by the "balance of terror", the modern interpretation of the ancient adage: *si vis pacem para bellum*—if you wish for peace, prepare for war.

Though total nuclear war can now mean the end of our technical civilization, the prevailing system of peace through power which implies further arms research, a continuation of the arms race, an increase in the arms trade, the gradual spread of nuclear weapons, must inevitably lead sooner or later to nuclear war.

Peace research has its origins in the anxiety aroused by this problem of war. The desire for peace is no longer based on moral or emotional grounds, but now has its foundation in the human reason. It is our soundly rational fears which have caused the question to be put whether a scholarly approach to the problem of war might not contribute to its solution.

Thus, after the Second World War the field of peace research enjoyed a rapid increase in interest and growth. Today peace research institutes are sprouting up everywhere in the world, while numerous other institutions have added peace research investigations to their list of activities.

It seems to me that the whole spectrum of peace research projects falls into four well-defined categories: war; peace; man, society and the international system; the means of bringing about change.

The study of war

Research projects in this category examine the causes of wars, the various forms in which war manifests itself, the functions of war and the effects of war. Clearly the study of war is a particularly difficult one since causes, manifestations, functions and effects will vary in each case according to time and place although in each case the various elements are always interdependent. The fact that each war has its own history and its own process of development vastly complicates the study.

Ever since Von Clausewitz' *Vom Kriege*, war has been primarily thought of as a "continuation of policy by military means." Von Clausewitz provides what nowadays is often called the strategic war model. As opposed to this, there is the cataclysmic war model, such as is outlined in Tolstoy's *War and Peace:* war as an unwanted and unpremeditated event, the result of blind social forces, disaster arising out of hazardous international intercourse, or—to put it another way—out of dangerous international "traffic".

The difference may be stated thus: in international traffic, the Clausewitz war is a deliberate manner of driving, the Tolstoy war a traffic accident.

If it may be said that strategic total war has been eliminated from the repertoire of practical international behaviour, accidental total war, resulting from the escalation of manœuvres in conflict situations, has not. Nor, as a glance at the world situation tells us, have either strategic or accidental limited wars. What this all makes clear is that the danger for the world lies in the "accident", in conflict situations, whether between big states or small, chain-reacting out of control.

This spotlights the reason why the aspect of peace research receiving the greatest attention by workers in this field is general conflict theory.

This entire study of war is now widely known among peace researchers as polemology, from the Greek,

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polemos, "war". Some hold, in fact, that polemology is a field apart from but complementary to peace research, which they feel rather pertains to the specific question of how to maintain or re-establish peace. I myself believe that in practice there is no real distinction between polemology and peace research and that the two terms are, in fact, synonymous.

A few peace research institutions are specifically oriented towards the study of war. Among them may be mentioned the Institut Français de Polémologie in Paris. However, other peace research institutions are also strongly involved in this same area; two-thirds of all institutions totally or partially dedicated to peace research are interested in general conflict theory, a branch of polemology.

The attempt to formulate a general conflict theory follows from the recognition of two points that conflict characterizes almost all social systems of all sizes and that conflicts show fairly similar patterns in the way they evolve. Thus, conflicts within the family, in economic life—as illustrated by labour strife—in political life, in religion, in race relations and in international relations all have observable similarities.

The objective of studies of these manifestations is to find the basic generalizations which apply to all and to assemble such generalizations into a theory of conflict, similar in kind to economic theory.

A general conflict theory, once formulated, would enable the prediction of results, as does any scientific theory. As applied to conflicts, this means the prediction of the course of development and probable outcome of the particular case and the known structural facts of society have been established.

Givin the predicted probable outcome of the trend of a given conflict situation, it would be theoretically possible, if the trend indicated is towards war, to put brakes on the situation before it got out of hand. Clearly, the development of a general conflict theory, or even of a sound working hypothesis, would be of great value in reducing the chances of accidental wars.

Polemology not only includes studies directly relating to general conflict theory, such as comparisons between industrial conflicts and international conflicts and international conflicts, but other research projects on such topics as the nature of cultural conflicts in periods of change, relationships between population increases and war, the relationships between war mindedness in a culture and other aspects of that culture, and general military strategy.

Some projects in this area deal with simulations of conflict situations, sometimes using computers, and with models of international conflict, wherein the several national factors involved in the development of international conflicts are examined.

The study of peace

This area of peace research examines the various forms of peace and the problems in a state of peace which tend to destroy it.

When talking about peace certain basics must be realized. It can be asserted that peace is not a natural state. It is in the nature of man and beast to be primarily concerned with self, to identify self with things dear to it, and to be stout in their defence.

This should not be misinterpreted. I do not mean to say that war has its roots in that which is animal in man, because, among animals, a life-and-death struggle between members of the same species is a rarity. They fight for a female, or for living space, or in order to determine which is the stronger. Moreover, the large-scale group fight between bodies of congeners occurs, with the exception of some species of rats, only among men.

So it is hardly scientific to call war a manifestation of animalistic behaviour, and to speak of "beastly" wars, because animals just do not behave that way.

That brings us to the second basic point: that war is inextricably linked to what in man is peculiarly and uniquely human. As Raymond Aron has written, in *Guerre et Paix entre les Nations*, "The difficulties of peace relate more to the humanity than the animality of man . . . Man is the creature who is capable of preferring revolt over humiliation and his truth over life."

Starting from such foundations, peace must necessarily be a far from simple matter. There are a number of different concepts of peace which must be taken into account.

There are, for example, the paired concepts of negative peace, which is simply a state of non-war, and of positive peace, which implies the making of accommodations between groups so they can live together within a mutually accepted system of values. Our immediate concern is necessarily this negative peace, the mere avoidance of war, and this is indeed, what largely occupies the statesmen of the world at this time

Static and dynamic peace

If we try to confine ourselves simply to banning war as by a prohibition such as that in the United Nations Charter, what we are really doing is excluding war as a way of resolving conflict situations, yet without removing the conflict situations and without providing any alternatives to war.

This is an impossible situation, because the conflict situations must become so tense that they necessarily erupt into violence. But as soon as we attempt to make some arrangement for the prevention of open conflict, or arrangements for the peaceable solutions of conflict situations, we are already within the realm of positive peace.

Another distinction that may be made is that between static and dynamic peace: between peace attained by the maintenance of a *status quo* (the kind of peace envisaged in the Covenant of the League of Nations) and peace attained by the adoption of ways and means to ensure peaceable change and re-adjustment of local, national and international social structures.

In a dynamic era, it is much more evident than in a period of stability that peace is only possible if changes can be adjusted to without violence. We are living in an exceptionally dynamic era, owing to the release of atomic energy and the emancipation of former colonies.

Among the peace research studies dealing with the various factors of peace in its several concepts are those analysing the balance of power, cases of prolonged peaceful relations between nations. United Nations peacekeeping operations, mediation and arbitration, and non-violence as a method of defense.

Another large group of studies deals with the problems which have a strong tendency to rend the fragile fabric of peace. Two conspicuous examples are world armament and world poverty, but there are certainly others which are closely related, such as population pressures, intra-national tribal and ethnic group antagonisms, the shortage of arable land, the inadequate world food supply and the economic and political underdevelopment of new nations.

The urgency of the arms problem can be seen by making a comparison with the animal world. In the animal world there exists a kind of equilibrum between the degree of aggressiveness peculiar to a given species and the weapons which that species has at its disposal. Aggressive species have only weak weapons at their disposal. Non-aggressive species may be heavily armed. There probably have been species which combined great aggressiveness and a great potential for the infliction of injury but, if so, these species have died out.

The trouble in the case of man is that science and technology have multiplied the effectiveness of his weapons millions of times, but this process has not been counterpoised by an adequate reduction of his aggressiveness. This is the peace problem relating to weapons, of which there are too many at the disposal of the wealthy countries.

The other major peace problem follows out of the unequal distribution of material benefits, with too few being at the disposal of the poor nations which represent two-thirds of the world's population. The distance between the rich and the poor is widening every year. The widening of the gap is bound to lead in the long run to revolutions and wars.

Peace research projects which relate to the major problems of peace and to the formulation of the conditions for peace include those on arms control, the influence of industrial-military complexes, the economic and social consequences of disarmament the social aspects of technical assistance, and, in fact, all aspects of economic development.

About one-third of peace research institutes are working on mathematical models of arms races. Such models, like all mathematical models of complex dynamic structures, are necessarily somewhat simplified but can sometimes provide useful insights.

Man, society and the international system

This area of peace research examines the world as it is, not as it should be if we want to prevent war. It investigates the world as we find it, with the people in it as they truly are—people with their rational and irrational elements, with their loves and hatreds, their suspicions and enmities and in particular with their tendency to distort the image of their environment until it fits the picture of the world they have made for themselves.

While man as he really is must be the point of departure in our understanding of this combative world, peace research must also deal with the groups in which man lives, the states, collective bodies with their own sociological laws, in which the past plays a dominant part, where tradition often carries the day and emotionality plays a predominant role, within which thought and action are based not on humanity, but on nationality, in which conformity is the rule and independent thought is looked on with suspicion, in which collective distortions of reality, especially at critical junctures, have a fatal effect.

Bearing on these matters are peace research investigations into ethnocentrism—acceptance of the standards of one's ethnic group as absolutely right and appraisal of all other groups by these standards—into race relations, into the sources and components of nationalism and into political ideologies and war propaganda.

Finally this area of peace research deals with the relationships and behaviour of the world of sovereign states, that underdeveloped community of independent units organized into what is called the international system, in which right and justice receive hardly any consideration when it comes to vital issues, in which military power is so frequently the clinching argument.

Experimental studies on small groups, put into test situations where we see aggression, threat and conflict developing out of group behaviour, particularly out of intergroup rivalries, are providing insights not only into similar behaviour between far larger social groups which are segments of national populations, but into similar behaviour on the international scale.

Peace research projects are probing into all the many factors involved in international behaviour and international relations. They examine, for example, the workings of international diplomacy, the decision-making process in foreign relations, the role of élites in foreign policy decisions, the legal aspects of peaceful coexistence, World Court practices, the significance of geographic factors in international relations, the effects of modern warfare on popular ethical standards, and the reasons for the successful federation of peoples of different cultures—one example of this being Switzerland.

Other studies are devoted to making a semantic analysis of international disagreements, appraising not only how the opposing parties' different ideas of the meanings of the same words complicate conflict situations, but also how the intensification of conflict situations is manifested in a changing terminology in

interchanges, particularly by an escalation in the use of violent and threatening language.

The relations between states in the international system are today, as virtually always throughout history, totally "realistic", marked by a total absence of considerations of morality.

As Machiavelli put in his handbook for rulers, *The Prince*, "A ruler cannot be good in a bad world." A modern political scientist drew the same conclusion: "The international environment makes it difficult almost to the point of impossibility for states to behave in ways that are progressively more moral."

It is this pessimistic attitude which lies at the root of naked power politics. Optimists, however, think that the behaviour of an adversary in a controversy may indeed be favourably affected by a gradual *rapprochement* in matters of disarmament by taking graduated unilateral steps. The policy of the good example, in which the risk of a small concession is taken.

In any case, the antagonisms between states arise our of conflicts of interests. In some cases, the conflict of interests is such that a gain for one party must mean a loss for the other, as, for instance, in territorial disputes. Yet in the majority of cases the situation is different and an agreement between the two or a joint action would produce results advantageous to both. Proportionate mutual disarmament between two states is an example of this, since both states would maintain the same relative strength, but at far less cost.

Yet it has always been the case that the uncertainty which either party feels as to the possible conduct of the other, instead forces both of them to arm all-out, to engage in an unlimited arms race. The fact is that the conduct of one state is more or less determined by the conduct of the other, or by its anticipations as regards the other's conduct. States are accustomed to act upon the premise that other states, striving to promote their interests, will behave badly—which causes them to behave badly themselves.

The same state of mind applies in many other aspects of the conflicts between nations. States blindly pursue their own individual paths as they react to each other, including the path to war, in the belief that they are acting realistically.

I feel that what is basically necessary is a different system of international relations, incorporating new rules of conduct based on rationality. That is the task of international law combined with a world-wide organization which can keep a proper check on the observance of the rules for international behaviour it has laid down, and which has the power to enforce their observance.

The means of bringing about change

The fourth area of peace research includes a consideration of those forces in society which might help the world to realize the basic conditions for peace. One might think here of the churches, the arts and sciences, education, and mass communication, including the press, radio and television. These studies deal particularly with such questions as: "How can a large body of people be reached?"; "What is the role and significance of protest?"; and "What may be the influence of the idea of militant non-violence?"

To find the answers to such questions, peace research studies are being conducted on such general topics as the effects and effectiveness of non-violent protests, the effect of public opinion on foreign affairs, the role of mass media in relation to biases affecting international relations, the influence of communication channels and mass media on foreign policy issues, the methods of communicating the findings of social science to decision-makers and to the general public, and how the general public perceives the intentions of other nations.

Still other studies evaluate the educational programmes of international organizations, the effects of student interchanges on national attitudes and the role of religious movements on international relations.

Change in the present attitudes of the world towards war will come slowly. The degree of potential change in public opinion has been investigated. It appears that a considerable percentage (40 per cent) of those interrogated in one survey had not altered their views over a period of twenty years, even in circumstances most favourable to changes of opinion.

In other cases, the changes of opinion were very slight. Each generation has a relatively small radius of attitudes. Major changes usually only follow out of bitter experience, and tend to coincide more or less with the advent of a new generation.

In view of the components of the vast problem facing peace research, which are respectively man, the group (state) and the world of states, it is obvious that the science of peace must necessarily be a broadly multidisciplinary one.

Since most the topics of peace research fall clearly into the domain of the social sciences the scientific staffs of peace research institutions are heavily weighted with specialists in various social science fields. Among them are those trained in history, economics, international law, international relations, political science, and social psychology.

However, specialists in other disciplines at the margin of the social sciences or in some of the physical and biological sciences are increasingly finding a place on peace research staffs. Many staffs now include specialists in mathematics and statistics, military science, geography, physics, anthropology and psychology. Almost one-third of all peace research institutions employ philosophers.

Controversy between two schools

It is regrettable that the number of biologists on peace research staffs is still relatively low, for these are the scientists who must appraise man, to determine how his innate biological characteristics affect his behaviour. Many peace researchers are not sure that the study of man as an aggressive animal falls within the scope of this field.

Co-operation between the disciplines is by no means an easy matter, since the various branches of learning have gradually isolated themselves, developing their own apparatus of research, and wish to keep their respective spheres free from the taint of outside influence. The process of integration has been set in motion, but it is still far from being completed.

While it is fundamental that the science of peace must aim to become more and more an exact science approaching the natural sciences, it is evident that, as a social science, it can only make limited utilization of the methodologies of the natural sciences.

Peace research methodologies may be classified, generally speaking, as being of two types, and there is a controversy currently going on about their respective merits. The first approach is what we may call the "traditional" or "historical-analytical" approach. The second is the "modern" or "mathematical" approach, which turns to statistical methods, mathematical analysis and mathematical model-making in the treatment of the subject matter. The controversy between adherents of the two schools is an extension of the same controversy as is found in the fields of sociology and international relations.

My conclusion tends to be that both methods are indispensable, because they are complementary. The exact method will often succeed in proving beyond refutation what the traditional method has suggested. Moreover, figures form an international language which can be understood across the frontiers of states and ideologies.

Usually peace research starts within a national context. In each country, it bears a national stamp and employs a national rhetoric. Each investigator's outlook cannot fail to be conditioned by the system of values prevalent in his own country, by what Julius Stone (in "*Aggression and World Order*") called "the national versions of truth and justice."

The investigator sincerely strives for objectivity, but he does not escape subjectivity. This has an advantage in that he speaks the language of his environment and is understood in consequence. Obviously, this is necessary for any social science which wishes to have any impact on society at all.

The drawback is that where different approaches are made in different parts of the world, as in western and eastern Europe, for instance there are serious problems of mutual comprehension. Hence the necessity of contact and of confrontation, for the ultimate establishment of common points of departure and common bases of understanding.

In our divided world, we shall be very long in achieving the common starting points, the Greek "topoi", which according to Plato's ideal might convince even the gods. But in a situation where, I believe, peace can only be finally realized as a universal peace achieved by a universal culture, it is imperative that this common basis be established as soon as possible. ▲

BLAST SHELTER *(Continued from page 5)*

Future Studies

With the success of the family blast shelter in Event Dial Pack, three main problems remain. First, long term habitability of the shelter should be tested. Oxygen, carbon dioxide, and carbon monoxide levels, humidity and temperature should be monitored over a period of a week to ensure that the shelter can be continuously occupied as a fallout shelter. Discussions on the feasibility of such a study are taking place with DRES. Second, the new hatch cover design must be tested. A new design has been developed and several samples made in the Small Structures Laboratory of Canada EMO. Third, a report on the project must be completed and final designs prepared and published for the interested public.

More work remains in the communal shelter problem. The models tested in 1970 are idealized, that is, all small details have been eliminated. Entrance configurations, ventilation systems, and problems posed by peacetime occupancy must be investigated before information can be made available to the public. Still more analysis on the cost-effectiveness of the designs when proven must be carried out before any recommendation could be made to government.

Conclusion

Several years of work by Canada EMO and Defence Research Establishment Suffield have resulted in the near completion of the family blast shelter prorect and intermediate results in the multi-purpose communal shelter project. The Canada Emergency Measures Organization is continuing to study these problems to improve its ability to give advice to the public and make considered recommendations to government.▲

AUSTRIA'S CIVIL DEFENSE
Part 1

by

Director Josef HANS, President of the Lower Austria Regional Association of the Austrian Civil Defense Association

This translation from the Ziviler Bevölkerungsschutz dated December, 1969, became available about six months ago. The Digest considers the Association's views are of considerable interest to Canadian civil emergency planners as well as those in other NATO countries. The full article will be republished in two parts with Part II in the April-May edition.

For a long period of time, Austria occupied last place in Civil Defense problems among the European family of nations—at least where protection of the civilian population against weapon effects of all types in an emergency is concerned. There was good reason for this situation! While other nations were able to continue the measures that they had taken during World War II, expanding them without interruption after 1945, Austria experienced a pause in her development that was not of her choosing. While Austria was a liberated country, it was also a country occupied by four powers for more than a decade, a country that had no freedom of decision.

However, to stand still means to slide backwards! Especially where not even the previous resources are retained. For, after the war and during the years to come many facilities and items of equipment that were valuable for the protection of the civilian population had been destroyed and captured, or used for different purposes. Moreover—and this is understandable from a psychological point of view—the will of the people to protect themselves had been completely paralyzed. And this took place in spite of the fact that an arms race of unimaginable dimensions was starting all over the World.

The memory of the terrible deprivation of war-time and post-war years was too vivid to allow the people even to think of the restoration of an "air raid system".

Moreover, in the face of the terrible threat from nuclear weapons there was a widespread opinion to the effect that life and health could not be protected against the lethal effects of nuclear weapons in any event, so that all Civil Defense measures would be completely useless. The result was a "don't-look-it-won't-happen" policy beyond comparison. Not only the responsible persons in the Federal, Land, and Township Governments succumbed to this fallacy; it did not fail to have its effect on even the smallest cell in the community, the family—and hence on the broad masses.

State Treaty Grants Full Sovereignty

Ten years after the end of the war, Federal Chancellor Ing. RAAB went to Moscow and achieved the restoration of the country's full sovereignty and the withdrawal of occupation troops. On 26 October 1955 the Austrian National Council resolved the following Federal Constitutional Act:

Article I: In order to maintain permanently her external independence and the integrity of her territory, Austria freely resolves her neverending neutrality.

In order to safeguard these purposes Austria will never join any type of military alliance and will not permit the establishment of military bases by foreign nations on her territory.

Article II: The Federal Government is charged with the implementation of this Federal Constitutional Act.

By declaring her neverending neutrality, Austria assumes all the obligations that arise from this promise, especially that of being prepared and ready at all times to maintain and defend her independence through all available means.

Consequently, there is no doubt that Austria's neutrality must be an armed neutrality tied to quite severe and stringent duties for the state and for its citizens. The consequences from this situation lead to "Conprehensive National Defense". For the forces that could threaten this status represent a differentiated picture; in addition to military actions they could manifest themselves politically, economically, or psychologically—and always they will represent a quite deadly threat.

Recently, Federal Minster of Defense Dr. PRADER stated at acivil defense rally in Vienna:

"The times where front and home country represented two separate entities are gone forever. For this we have painful, world-wide proof... Neutrality for Austria means not only an army that is capable of guarding that neutrality, but also a Civil Defense system that is prepared and ready for action at any time.

Like the Forces, our Civil Defense cannot be a purpose in itself. It, too, requires the active participation and assistance of all the population... "For it would be too late and therefore useless to show this goodwill and the sacrifices required when the emergency has arrived."

Whatever we fail to prepare today will not be available tomorrow. The public must be told this truth again and again and in no uncertain terms... "We should

always stop to consider that larger sacrifices can be avoided by making small sacrifices at the proper time."

"Comprehensive National Defense"

This concept is reflected in the Government's statements in recent years, beginning with the message by Federal Chancellor Ing. RAAB in 1959. In July of 1961 the Council of Ministers decided to build up a National Defense System that would extend to the military, civilian, economic, and educational areas. This was the signal for the start of a "Comprehensive National Defense" in Austria. Committees were established immediately in the different ministries, charged with preparing a National Defense Plan. In the course of these efforts the potential threats to which Austria is exposed were defined accurately, and appropriate missions were developed for the individual areas.

Although the responsible persons in the Government were well aware that defense "by all means available" required more than the introduction of "general military service" and the creation of armed forces in the form of a Federal Army, it took several years more before the "Comprehensive National Defense" was proclaimed in a message by the Government dated 11 May 1965 which was supported by the two large parties—OVP and SPO.

But this is understandable, for Austria has never been neutral in the Thousand years of her history—in the sense of her present neutrality status. Therefore, compliance with the commitments that were assumed, including especially the national defense, must start out from new concepts. The Austrian had to be, and still must be, reeducated, and that takes time!

The Government's message defined as "Comprehensive National Defense" the total of all efforts in the military, civilian, economic, and educational areas that are necessary to preserve and defend neutrality. Thus it was made clear that National Defense is no longer a function of military authorities alone, but includes responsibilities by other ministries. This cleared the way for the establishment of a Civil Defense System in Austria. Oh yes, "green light" for Civil Defense was extremely necessary, for the defense of a country by military means is inconceivable without effective protection for the civilian population.

In his major address on the occasion of a Civil Defense rally last fall to start off the campaign "Civil Defense concerns everybody" in Vienna, Federal Chancellor Dr. Klaus stated the following, and I quote:

"A small, neutral country such as Austria will have a chance of maintaining her neutrality only if she holds to that neutrality without compromises or qualifications and under any circumstances, and if she can make it credible that any infringement upon that neutrality will be possible only with a maximum of effort and losses. It was these considerations that led to the decision taken by the Federal Government in 1962 to take appropriate measures in the economic and civilian areas to ensure the protection of Austrian neutrality, in addition to the military defense posture already existing at that time.

In this system, Civil Defense has a well defined role. Its mission is to show the masses of the civilian population the means that, under the present-day state of the art, afford a chance of survival with a minimum of losses in periods of crises of all types. There is no doubt that Civil Defense in doing so will create a certain backup and freedom of action for all active measures by national defense authorities.

However, I would like to state expressly that the objective of Austrian Civil Defense can rest primarily only in that humanitarian mission of providing a maximum of security and assistance to the civilian population in times of threat. In addition, Civil Defense is expected to contribute toward a positive attitude on the part of the civilian population with respect to the overall protective and security system, since—in a manner of speaking—it represents that part of the system which is closest to them."

In this connection it must be pointed out that, in Austria, Civil National Defense [zivile Landesverteidigung] and Civil Defense [Zivilschutz] are not identical. Civil Defense is only part of Civil National Defense, although its most important part, since its mission is to preserve the people themselves. In addition to Civil Defense the area of Civil National Defense includes two other important responsibilities, these being

1. to preserve the proper functioning of Government and public administration or, in other words, to preserve a state based on justice even under conditions where freedom of action is restricted as a result of measures originating outside the country; and
2. to protect all those installations which for some reason or other are of paramount importance to the country's survival (such as key installations of railroads, postal and communication services, energy-producing industries, etc.).

While the establishment of Civil Defense in Austria is primarily a function of volunteer organizations such as the Austrian Civil Defense Association [Osterreichischer Zivilschutzverband], fire departments, Red Cross, Worker's Aid Union [Arbeiter-Samariter-Bund], Mountain Rescue Service [Bergrettung], Rescue Dog Brigade [Rettungshundebrigade], and others, all other measures of Civil National Defense are government functions.

Escalation of the Threat: Crisis — Threat to Neutrality — War

However, the declaration by the Austrian Government on the "Comprehensive National Defense" also takes into consideration the fact that Austrians so far have always learned to associate the word "defense" to war only. By stating that neutrality knows many

forms of threats it creates clarity at the same time with the three escalation stages of the threat faced by the country.

A state of international tension and the danger of conflicts is called a *crisis.*

A state of armed conflict in the country's vicinity is called a *threat of neutrality.*

A military attack on Austria is called *war.*

We have already experienced the case of "crisis", that state of international tension that does not fail to have its effect on Austria. On repeated occasions, Austrian territory and hence the country's sovereignty have been violated by aircraft. The case of "threat to neutrality", that is armed conflict in neighboring countries, is quite conceivable. It is necessary to provide for it accordingly. The case of "*war*" is the least probable case. Let us hope that it will never occur.

In a lecture on the occasion of the opening ceremony of the first Civil Defense Week in December, 1967 in Vienna, Major General SPANNOCCHI, Commander of the National Defense Academy, stated the following:

"Comprehensive National Defense is and will remain to be an entity. It is a chain that will be as strong as its weakest link. However, with all possible political and human foresight, Civil National Defense and with it our Civil Defense may have to become effective at an earlier date than military defense; in fact, it is necessary even before we are attacked.

Therefore, it is my belief that we should understand as early as possible that failure to act in this area is no longer acceptable."

First Beginnings in Rebuilding the System

Many countries in Europe, especially the neutral countries such as Switzerland, Sweden, and Finland, have already achieved a respectable level in their Civil Defense efforts. Austria must work hard to catch up with them.

We cannot state that nothing had been done in Austria in this area. The authorities and the volunteer organizations have been and still are very active to make the "stepchild" Civil Defense a member on a level with others in the National Defense System. The regular and volunteer fire departments of companies and municipal governments have been trying since 1945 to reorganize the fire departments and to turn them into an effective instrument for assistance, to include technical emergencies; they have been very successful at this, as we can see from practical experience and from the international competitions in which Austrian fire departments participated! The newly created fire-fighting and rescue services are facilities that are admired even in foreign technical communities.

But the Austrian Red Cross and the Worker's Assistance Union, too, can be proud of their organizations, their facilities, and their achievements, including missions performed beyond the country's borders.

Also, the Austrian Mountain Rescue Service [Österreichische Bergrettung], the Austrian Water Rescue Service [Österreichische Wasserrettung], and the Austrian Rescue Dog Brigade [Österreichische Rettungshundebrigade] with their great numbers of volunteer workers and helpers deserve praise.

While these organizations in most cases can look back on decades of successful activity and therefore enjoy a tradition, the Austrian Civil Defense Association [Österreichischer Zivilschutzverband] was newly founded in 1961. However, in spite of the short period of its activity it can be satisfied with the results achieved to date. It is due to this organization that the term Civil Defense is no longer a foreign word in Austria today.

The first beginnings in rebuilding a Civil Defense System in Austria, therefore, were marked primarily for the unceasing efforts of the volunteer organizations.

The degree to which these efforts were acknowledged in the highest government circles is proved by an interview granted by State Secretary MINKOWITSCH to the Austrian Radio System on the occasion of the Civil Defense Rally in Vienna (extracts):

Reporter: State Secretary MINKOWITSCH, the lecture held by you at this rally today was entitled "Continued Development of Civil Defense in Austria." Exactly where is our position today with respect to Civil Defense?

State Secretary MINKOWITSCH: If I may say so, we have progressed much farther in Civil Defense in Austria than many of our citizens would assume. If I merely consider the volunteer fire departments, the Austrian Red Cross, the Worker's Assistance Union, and the Austrian Civil Defense Association which has sponsored today's meeting, if I consider that a total of about 240,000 people, associates in a remote, figurative sense of the word, have already devoted themselves to this humanitarian concept of Civil Defense, then I feel really justified in stating that we have progressed to an encouraging degree.

Delineation of Responsibilities and Statutory Provisions Required

The efforts taken by the authorities were less successful in the beginning. The Committee "Z", organized by the Federal Ministry of the Interior early in the sixties and including representatives of the Federal Ministries involved, the Land Governments, the Austrian Cities Union [Österreichischer Städtebund], the Austrian Municipalities' Union [Österreichischer Gemeindebund], and the volunteer organizations, very soon became incapable of action. Not because its members lacked the necessary initiative, but simply because of the confused legal situation. For the Austrial Federal Constitution does not include a set of responsibilities that would correspond to "Civil Defense".

To this date, the lack of a clear delineation of responsibilities—between Federal, Land, and Municipal governments—and of a comprehensive statutory arrangement for this problem, aggravate all work in the interest of Civil Defense. This lack of clarity in the statutes is also the cause for the insufficient funding level for Civil

Defense. This is one of the facts of life: the authority that is responsible must take care that the necessary funds are made available. The crux of the matter in a dispute for competence is that nobody wants to be competent when the bill must be paid.

Of course, there is merit to the position held by many, foremost by Roland MINKOWITSCH, the State Secretary of the Ministry of the Interior who is at present responsible for Civil Defense, that much could be done if the present situation with respect to competence were exploited fully. They felt that both the Federal and the Land governments still had sufficient potential for collaboration in the interest of Civil Defense.

All the Land Ministers have confirmed this view in one of their last meetings. Only if the further expansion of the Civil Defense System should be stopped again as a result of the jungle of competences, only then would the Legislative be asked to take action.

However, the Austrian Civil Defense Association takes a different position. For years it has been writing resolutions and petitions to ask the political parties to instruct their representatives in the National Council to take the initiative in this crucial question of a statutory basis.

Only recently the President of the Austrian Civil Defense Association, former State Secretary GRUBHOFER, stated at a working meeting held by the Association:

"Especially, however, Government and Legislative would have to take care that Civil Defense statutes are promulgated which satisfy all the requirements and permit profitable activity and cooperation between all the organizations, and that the necessary budgetary funding is made available.

Certainly, many partial problems in Civil National Defense can be resolved by exploiting the existing legal situation, but, unfortunately, not all of them.

For instance, the existing competences and statutory provisions are not adequate to regulate measures such as:

- Drafting personnel to perform functions in Civil Defense,
- Providing services of all types, especially for facilities and Civil Defense equipment,
- Construction of shelter facilities in older buildings (a change in the rental laws would be necessary),
- Civil Defense in industrial plants,
- Civil Defense in business enterprises,
- Civil Defense in government agencies."

Although the representatives of all the parties represented in the Parliament often enough support the demands of the Austrian Civil Defense Association, in the Federal Legislative, in the Land Legislatives, in the National Defense Council [Landesverteidigungsrat], and in rallies held by the Association, the decisive step has not been taken to this day. Apart from other considerations the reason for this is probably merely that opinions are divided among all the party factions in Parliament as to whether a statutory regulation is necessary. At the present time the pros and cons are approximately equally divided.

But this has not always been so! Again, the arguments used by the Austrian Civil Defense Assocn. have resulted in a change of heart on the part of many politicians. So we may hope that, in spite of the opposition between federalism and centralist doctrine, a qualified majority will soon come about for Federal Constitutional Amendments or shifts of competences require a two thirds majority.

The Austrian Civil Defense Concept

Considering the fact that, according to the legal situation existing in Austria, the Land governments are clearly responsible for important areas in Civil Defense such as construction measures, fire department and rescue services, protection against natural catastrophe and assistance in the event that it occurs, the original directives by the Committee "Z" at the Federal Ministry of the Interior provided that Civil Defense be confined to the protection of the population against the effects of all types of weapons in war, so that the "air raid system" of the old days would have a comeback, although with consideration for the advances in weapon technology.

It was impossible to win over the Austrian population for this type of concept. And it required some effort before the Austrian Civil Defense Association was able to gain acceptance for its views that culminated in the slogan "Civil Defense is more than just air raid protection." Gradually the insight gained ground in Austria, too, that man's life, health, and property can be threatened by more than just weapons.

The preface to the 1961 "basic concept" of the Austrian Civil Defense Association reads:

It is the function of Civil Defense to protect all the people against any hazards involved in every-day life that are caused by natural catastrophes or that threaten us as a result of armed conflict in which we might become involved in spite of our neutrality.

Civil Defense is more than just air raid protection!

A brochure entitled "Your Protection—Civil Defense" that was distributed to all households in Austria with a circulation of 1.5 million already takes into consideration all of this modern basic concept; it was distributed in 1965 by the Federal Ministry of the Interior in cooperation with the Austrian Civil Defense Association and with the consent of all the Land governments. This brochure contains the following paragraph:

Today, assistance in emergencies cannot be left any longer to the efforts of a few idealists. The terrible natural catastrophes suffered by Austria in the past years are proof that emergencies can be overcome only if everybody helps. Also, let us keep in mind that there cannot be a guarantee for "everlasting peace".

Thus, Civil Defense becomes an important instrument in the defense against many hazards that might threaten our community even tomorrow.

In recent times, and, again, this is a result of lacking delineation of responsibilities, even the borderlines be-

tween Civil Defense and protection against catastrophes are becoming increasingly fluid. Some Land governments quite officially name the departments concerned Civil Defense and protection against catastrophe—or vice versa. Frequently the view is taken that these two humanitarian functions, Civil Defence and protection against catastrophes should be equated, should be considered one unit, and some even feel that Civil Defense should be subordinate to protection against catastrophes.

But, again, opinions in political circles are divided. In any event, a solution such as this would be in sharp contradiction to the principles of "Comprehensive National Defense" that aims at defeating an external threat, although there might be a tendency to place death and destruction resulting from weapon effects into the category of "catastrophe". Nor is it good to move from one extreme to another.

However this may be, it is not under dispute that Civil Defense and protection in the event of catastrophe have many common aspects and that in both cases the self-protection of the population plays a dominant role. Self-protection represents the core of both, Civil Defense and protection against catastrophes.

This concerns another characteristic of the Austrian Civil Defense Concept: the principle of "voluntary action". It is true that we have compulsory service in the military defense; however, there is no compulsory service in Civil Defense of the type demanded by the Austrian Civil Defense Association for a long time, at least in order to inform and train the population within the scope of self-help. Apart from governmental measures, the primary objective is to develop to a state of readiness on a broad, voluntary basis, the self-protection of the people, the self-protection in business enterprises and industries, and the regional assistance services by the mobile organizations, and to maintain that state of readiness.

In other countries, especially in Sweden, Finland, and Switzerland, they have different ideas in this respect. Experience has taught them that "voluntary" identifies only a small percentage of the population. The overwhelming majority are prepared to provide for their future only if they are forced by legislative action.

Finally, we must point out a principle in our Civil Defense Concept which is highly important for the scope and type of protective measures: the potential threats. As in all other neutral nations in Europe, the Austrian authorities that are responsible for building a Civil National Defense start out from the assumption that in an armed conflict where nuclear weapons are employed—regardless of who may employ them—the neutral areas will be spared from the direct effects of nuclear weapons. Therefore, in addition to protection against the threat resulting from conventional weapons we must take precautions against radioactive fallout through a corresponding radiation protection. This assumption determines the primary character of the shelter facilities for the civilian population. "Basic protection" is the word in Austria; in the nations that are part of a bloc the protection factor must be greater, of course.

Governmental Activities

The Austrian Federal Constitution expressly assures the right of life and of the protection of the life, health and property of any of the country's citizens. If we guarantee such rights we must take the appropriate consequences and take the necessary measures to do so.

Within the scope of Comprehensive National Defense the planning and implementation of Civil Defense is entrusted to the Committee "Z" established by the Federal Ministry of the Interior, however, with the reservation that the Committee can act only within Federal competences or, where the activity of this body extends to partial areas of Civil Defense that fall under the responsibility of the Land governments, that it will be confined to the coordination of all the efforts in the interest of nation-wide standardization of implementing measures. In questions where the Federal Government is not competent, the Committee "Z" can merely present recommendations to the Land agencies, and even that only if the Land representatives on the committee do not object.

In accordance with the political structure of the Austrian state the activity of the Committee "Z" is continued in the vertical structure in the Civil Defense headquarters of the Land governments, in the administrative districts, and in the communities. These headquarters have been activated down to administrative district level. They have proved their value already in the fight against natural catastrophes. Moreover, most of the Civil Defense headquarters have been constituted in the Austrian cities, townships, and villages, and have become active when natural or technical catastrophes occurred.

As in all countries all over the World, the Civil Defense field in Austria is organized horizontally into technical areas. The Committee "Z", acting in plenary session, established 16 working groups, to include warning and alert service, communications service, public information service, self-protection, Civil Defense in construction, radiation protection, medical services, agricultural and veterinary precautions, fire protection, technical assistance services, stockpiling, social services, and protection of cultural assets. As a result of their responsibilities, almost all the Federal Ministries are represented in the plenary sessions and in the individual working groups. In spite of the complexities of competences, some of these subcommittees produced considerable achievements and advanced this effort far beyond the mere planning stage.

The warning and alert service working group has established concrete proposals and effected a survey all over Austria to determine what is still available. More than 5,000 sirens are ready for operation.

The brochure "Your Protection — Civil Defense" which was distributed to all households through the

Land governments, as well as information and propaganda films, to include television spots, served to inform the civilian population; primarily, however, the Civil Defense School of the Federal Ministry of the Interior prepared the cadre personnel of Civil National Defense for their responsibilities. More than 308 courses were attended by about 7,910 public officials, members of the executive, doctors, teachers, functionaries of the assistance organizations and members of the Austrian Civil Defense Association.

Special attention was devoted to radiation protection. In addition to ten government monitoring stations used to monitor the radioactivity in the atmosphere and in the water, in an emergency the city and rural police forces have a total of 200 motorized radiation detection teams, and one additional team at the seat of each Land government. Moreover, the fire departments and the Red Cross have excellent equipment and training for this function. In addition, the fire departments have their normal mobile units for firefighting, rescue service, and technical services, and beyond these they have some radiation protection platoons that have already proved their effectiveness in major exercises conducted in conjunction with the Federal Army and the Executive.

Medical services, too, have been expanded considerably. The Red Cross was equipped to a degree that it is almost unable to catch up with respect to the recruitment and training of the required personnel.

Also, enormous progress has been achieved last year in the area of self-protection. The responsible subcommittee has completed a quite workable concept that is responsive to the principle of "voluntary action".

This plan provides that, this year already, the first build-up phase will begin with the training of key personnel, called "self-protection supervisors" [Selbstschutzwart] by the Austrian Civil Defense Association. In a team effort, the Austrian Civil Defense Association, the Red Cross, and the fire departments will gradually instruct about 300,000 men and women.

In this respect the primary responsibility rests with the Civil Defense Association, for it alone can recruit "volunteers" and train them for all the areas of self-protection on the basis of existing association statutes. The key self-protection personnel who are trained through these efforts and ready for operation will be handed a "self-protection passport" [Selbstschutzpass] that serves as their identification as competent personnel for rendering assistance in the event of accidents and catastrophes of all types.

The recently activated coordinating committees at Federal and Land Government levels as well as a contacts committee for the purpose of achieving constructive cooperation between the volunteer organizations contribute toward a further, positive development of Civil Defense in Austria.

Consequently, State Secretary MINKOWITSCH was right in stating that considerably more has been achieved in the area of Civil Defense in Austria than the average Austrian would consider true.

Also, the funding levels set aside by the Federal, Land, and Municipal Governments for Civil National Defense as a whole are quite respectable, especially the public information funds. Of course, considerably more funds will be required in the future, if Civil Defense is to become an effective instrument for Austria's security and for the protection of her people.

(to be continued

Editorial — "EMO Lives!"

from
Halifax Chronicle Herald

EMO, which at first sight looks like the name of a detergent, is alive and functioning. At least, EMO lives and works, in an emergency, in some parts of Nova Scotia.

The Emergency Measures Organization has suffered the fate of many such civil defence outfits, in more than one country, in an age of threatened nuclear warfare.

Probably a majority of people feel, if they any longer are disposed to think on such dreadful things, that there can be little point in making preparations for a nuclear attack on their cities or towns, when the chance of surviving such a cataclism appears to be negligible. During the 1950s, some Americans (who themselves had never experienced even the relatively primitive pre-nuclear aerial blitzes of World War II) started getting deep shelter-conscious. Yet most people felt that, in the awful event of the great deterrent failing to deter, there was little the civilian population, or the military forces, could do to protect them.

In these circumstances, the Emergency Measures Organization received little support, and only modest financial subsidy. Yet emergencies can arise other than the outbreak of World War III. Even if a nuclear balance of terror did not exist, there might be good reason for retaining EMO. Indeed, if EMO had been in operation at the time of the 1917 Halifax explosion, relief measures might have been put in hand more quickly than was the case.

As emergencies go, last Christmas weekend's severe snow storms in Nova Scotia were not major disasters, but in some communities they were sufficiently serious to test the mettle of all organizations capable of coming to the aid of a stricken population. EMO at Bridgewater and other communities, evidently was the right organization, with the right training and equipment in the right place, at the right time.

100 WARS AND OTHER CONFLICTS SINCE WORLD WAR II

More than 100 wars or other international and national conflicts and disputes have occurred since the end of the Second World War. These range in scale from outright international wars and major civil wars to incidents with differing degrees of conflict. On this page, grouped by region, we present a line-up of the major and other conflicts that have erupted in different parts of the world between 1945 and 1968. How precarious the bird of peace! Presentation below is based on tables published in the SIPRI Yearbook of World Armaments and Disarmament, 1968-69.

Reprinted from the UNESCO Courier–November 1970

Europe

Greek civil war (Greece, Yugoslavia, Albania, Bulgaria, U.S.A.); **Berlin crisis**. (U.S.S.R., NATO); **Trieste question** (Yugoslavia, Italy); **Corfu channel rights** (U.K., Albania); **Cyprus independence** (U.K., EOKA forces); **Hungarian crisis** (U.S.S.R., Hungary); **Cyprus** (Cyprus, Greece and Turkey, UN. intervention); **Greek military coup** (civil government and political parties, military junta); **Cyprus question** (civil government and Greece, Turkish minority and Turkey); **Czechoslovakian crisis** (Czechoslovakia, U.S.S.R., Poland, East Germany, Bulgaria and Hungary).

Middle East and North Africa

Iran (Iran, U.S.S.R); **Egypt independence** (U.K., Egypt); **Palestine question** (Israel, Egypt, Iraq, Transjordan, Syria, Lebanon); **Arab-Israeli War I** (Israel, Egypt, Iraq, Transjordan, Syria, Lebanon); **Morocco** (France, Morocco); **Tunisia** (France, Tunisia); **Iran** (U.K., Iran); **Algerian war of independence** (France, Algeria); **Aden-Yemen border** (U.K., Yemeni tribes); **Suez invasion** (U.K., France, Israel, Egypt); **Sinai campaign** (Israel, Egypt); **Spanish Morocco** (Spain, Morocco); **Muscat-Oman revolt** (U.K., Muscat-Oman); **Lebanon and Lebanon civil war** (U.K., U.S.A., Jordan, Lebanon); **Mosul Iraq revolt** (Iraq government, rebel officers); **Tunisia-Bizerta crisis** (France, Tunisia); **Iraq-Kurds** (civil government, Kurds); **Kuwait intervention** (Iraq, Kuwait, U.K., Arab League); **Morocco-Algeria border** (Morocco, Algeria, Organization of African States intervention); **Yemen civil war** (royalists, republicans, U.A.R. and Saudi Arabia); **Aden civil war** (U.K., Aden, Yemen, U.A.R.); **Syrian coup d'état** (civil government, military rebels); **Arab-Israeli War II** (Israel, U.A.R., Jordan, Syria, Iraq, Lebanon).

Far East and South Asia

Indonesian war of independence (Duch government, nationalists); **Indo-China war, Viet-Nam I** (France, Indo-China, Laos and Cambodia); **Chinese civil war** (Kuomintang, Chinese communist party, U.S.A.); **Indian communal riots** (India, Pakistan); **Taiwan-Formosa** (Kuomintang, Taiwanese); **Hyderabad, India** (Indian government, Nizam and Moslems); **Kashmir** (India, Pakistan); **Philippines civil war** (Philippine government, Hukbalahap rebels); **Burmese civil war** (Burmese government, Karen and Shan tribesmen); **Malayan insurgency** (U.K., Malaya, and Malayan communist party); **Burmese border conflict** (Burma, Kuomintang forces); **Korean war** (North Korea, Mainland China, Rep. of Korea, U.S.A. and U.N.); **Tibet I** (Tibetan govt., Mainland China); **Quemoy-Matsu Islands** (Mainland China, Rep. of China, U.S.A.); **Tibet II** (Mainland China, Tibetan guerillas); **Viet-Nam war II** (North Viet-Nam, Rep. of Viet-Nam, U.S.A.); **Naga revolt in India** (Indian government, Nagas); **Burmese border conflict** (Burma, Mainland China); **Indonesian civil war** (government, communists); **Laotian civil war** (royalists, republicans); **Longju and Ladutch incidents** (Mainland China, India); **Thailand, Cambodian border** (Cambodia, Thailand); **West Irian** (Indonesia, Netherlands); **Goa, India** (India, Portugal); **Nepal civil war** (government, insurgents); **Viet-Nam war III** (Rep. of Viet-Nam, F.N.L., North Viet-Nam, U.S.A., Philippines, Rep. of Korea, Thailand, Australia, New Zealand); **Brunei revolt** (Brunel, U.K., Sarawak, North Borneo); **Indian frontier war** (India, Mainland China); **Malaysian confrontation** (Indonesia, Malaysia, U.K., Australia, New Zealand); **Thailand insurgency** (government, insurgents, U.S.A.); **Rann of Kutch** (Pakistan, India); **India-Pakistan** (Pakistan, India); **Indonesian crisis** (government, insurgents).

Latin America

Bolivia (government, insurgents); **Bolivia** (government, insurgents); **Paraguay** (government, insurgents); **Costa Rica** (Costa Rica, Nicaragua); **Colombia** (government, insurgents); **Honduras** (Honduras, Nicaragua); **Honduras** (Honduras, Nicaragua, Guatemala); **Nicaragua** (Nicaragua, Costa Rica); **Guatemalan intervention** (Guatemala, U.S.A.); **Cuba** (government, Castro rebels); **Venezuela** (Venezuela, Dominican Republic); **Dominican Republic** (Dominican Republic, U.S.A.); **Cuba (Bay of Pigs)** (Cuba, United States); **Cuba crisis** (Cuba, U.S.S.R., U.S.A.); **(Cuba missile crisis** (Cuba, U.S.S.R., U.S.A., Organization of American States); **Panama canal** (Panama, U.S.A.); **Guatemala** (government, insur-

gents); **Dominican Republic** (government, insurgents, U.S.A., Organization of American States); **Peru** (government, insurgents).

Africa

Madagascar (France, Madagascar); **Kenya-Mau-Mau** (U.K., Mau-Mau); **Cameroons** (France, U.K., nationalists); **Ruanda-Urundi** (Bahutus and Watusi); **Congo** (Congo, Katanga province, U.N. forces); **Angola** (Portugal, Angolans); **Somalia-Ethiopia** (Somalia, Ethiopia); **Burundi** (Ruanda, Burundi); **Portuguese Guinae** (Portuguese government, nationalists,) **Kenya, Somalia** (Kenya, Somalia, U.K.); **East African mutinies** (Kenya, Uganda, Tanganika, U.K.); **Congo-Kinshasa** (government, insurgents, Belgium, U.S.A.); **Mozambique** (Portugal, nationalists); **Nigeria** (coup d'état: government, army); **Ghana** (coup d'état; government, army); **Congo-Kinshasa** (Kisangani mutiny, government, army); **Rhodesian crisis** (U.K., white Rhodesian minority rule); **Nigeria** (government, "Biafra" insurgents); **Sudan, Uganda** (Sudan, Uganda).

NEWS COMMENT

from
Halifax Chronicle Herald

Public awakened to fact emergency units exist

By Ivan Shortliffe Staff Reporter

BRIDGEWATER—Implementation of the emergency measures organization during Saturday night's blizzard, has awakened the public to the fact that such an organization exists that is capable of swinging immediately into action, area director Napoleon J. Dupuis said yesterday.

He said that the EMO was primarily established to provide emergency services in the event of nuclear attack or during a natural disaster. Local municipalities appoint their own EMO officer to represent them and to prepare plans which would be implemented when required.

"The nature and extent of the emergency would be reflected in the plan implemented," Mr. Dupuis said, adding the plan could require total or partial mobilization of available resources.

Acting on the advice of highways divisional manager Jack Walsh, who reported the department could not keep roads clear during the storm that hit on the heels of the Christmas Eve storm that left 14 inches of snow, Mr. Dupuis put the EMO in high gear, following authorization by Warden Charles Walters. The Dawson Memorial Hospital was declared the emergency centre.

The organization has at its disposal five different types of equipment, readily available in the event of an emergency.

A casualty collection unit at Bridgewater, consists of stretchers and equipment necessary to move 144 patients from the scene of a disaster, together with minor first aid supplies.

Located at both Mahone Bay and Bridgewater are advanced treatment centres equipped to provide first aid, some emergency surgery and burn treatment to 500 victims.

A 200-bed emergency hospital at Liverpool provides that South Shore area with the equivalent of any modern hospital with that number of beds. It includes operating rooms, delivery room, X-ray and laboratory facilities and all other necessary items.

Five hundred people can be fed at any one time at the emergency kitchen at Bridgewater.

Also located here is a disaster trailer, designed to provide fire departments with equipment required to remove victims trapped in buildings or debris.

All units are easily transportable to the site of any disaster, Mr. Dupuis said. He said volunteers have been appointed by the provincial EMO headquarters, Halifax, to act as a nucleus staff, capable of setting the units into operation and supervise them while they are in use.

Mr. Dupuis, who is also administrator of the local hospital, is thankful that none of the units have been required so far, "but if it were necessary, they could be set up at a disaster site in very short order.

The response by South Shore residents was "tremendous," the officer said.

"Now we have a complete list of snowmobile owners, ham radio operators, that we never had before, and because of the recent emergency we learned a lot," he said.

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